University of Alberta

Growing Bamboo: A Case Study of Alberta We//net

by

Richard Peter Thornley

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A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Public Health

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Abstract

This thesis presents the results of a case study of Alberta We//net, a provincial health information system launched in 1996. The study was conducted using semi-structured interviews of elite individuals engaged with We//net, and reviews of We//net documentation and the related health informatics literature. The study focused on the influence of social and political factors on stakeholder reactions to the implementation of We//net. Multiple factors were identified and these are discussed. The study concludes that a number of the factors and issues identified in the We//net case are not unique to developing health infostructures, although some of the are perhaps specific to health programs. Future avenues for research are suggested.

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Chapter 1: Introduction

The Need

During the 1990s, the Canadian health care system underwent a series of changes leading to regionalization, largely in response to federal cutbacks in health spending (Armstrong & Armstrong, 1999; Lomas, Woods, Veenstra, 1997). In Alberta, previously autonomous health care facilities (e.g., hospitals, long-term care facilities) were organized into 17 Regional Health Authorities (RHAs) and two provincial mental health and cancer boards (Noseworthy, McAllister & Bader, 2001). During the same period, the United States also embraced health restructuring and reform, resulting in the formation of integrated delivery networks, integrated healthcare networks, and integrated delivery systems[1] (Hagen & Chapman, 1999; Teich, 1998). While there are significant differences between Canadian health regions and these American organizational solutions (Leatt, Pink, Guerriere, 2000), the goals of the efforts in both countries were quite similar: "to contain costs, improve health outcomes, increase the flexibility and responsiveness of care delivery and better integrate and coordinate services" (Lomas et al., 1997, p. 371).

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[1] Leatt, Pink and Guerriere (2000) suggest that integrated delivery systems (IDSs) require provider-specific and system-wide information systems linking consumers, payers, and providers, whereas RHAs have typically adopted provider-specific systems only. Furthermore, IDSs emphasize primary care delivery that provides consumers with "one stop" shopping, treatment choices, choice of providers, and better information to make decisions. IDSs focus on community and consumer needs, whereas it is argued that RHAs emphasize "the values of professionals and their need for autonomy" (p. 17) at the expense of consumer needs.

As healthcare organizations coalesce into regions or networks, they become faced with regional management questions. Hospitals no longer operate independently but instead regional administrators must look for ways to maximize resources across a number of hospitals and other facilities. Different sectors such as hospitals, physicians, and community-based care by necessity must work together. Patient-specific information needs to be accessible throughout the system (i.e., information needs to follow the patient) in order to provide "seamless" care and support consumer-focused organizational change. One key element in such efforts is information system integration (Alvarez & Zelmer, 1998; CIHI, 1998; Howard Research, 2000), although other elements, such as a "more developed form of clinical practice", are also essential (Griew, Briscoe, Gold & Groves-Phillips, 1999).

Ferrara (1998) has suggested that integration of information systems is necessary "to permit the different centres and units to [cooperate] on the basis of a substantial functional and information consistency, capable of ensuring that overall consistency of the health care organisation, which is necessary to increase the effectiveness and the reliability of the clinical, administrative, epidemiological and managerial activities carried out both at local and at territorial level" (p. 40). The Diebold Institute has called integrated health information systems "infostructures": "networks that electronically interconnect medical professionals, facilities, equipment, and consumers to facilitate the exchange of health information for health maintenance and medical treatment" (p. 13).[2]

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[2] "Ideally, the healthcare infostructure would have three loops of interconnectivity: (1) a provider loop, whose primary purpose would be to avoid the need to co-locate buildings, human resources,

Corrigan and Taylor (2000) have suggested that increased openness and responsiveness (i.e., enhanced public accountability) is both a motive for and consequence of the development of government infostructure. However, given the prevalence of heterogeneous information systems in healthcare, integrating information across institutions can be a formidable problem (Halamka, Osterland & Safran, 1999; Lucas, 1981).

Challenging as the problem might be, it is an important one. The Lewin Group (1998), an international strategic health and human services consulting company, has suggested that "the factors that affect the generation and management of health care information lie at the heart of every question bearing on the quality of health care services" (p. 20). The actions of Canadian federal and provincial governments have echoed this sentiment. As early as 1974 the federal government recognized that "there is a lack of a uniform and integrated system for maintaining health records of individuals; essential data are scattered in many locations: in physician's offices, hospital records, clinics, etc." (Lalonde, 1974, p. 28). Part of the mandate of the Canadian federal government's Advisory Council on Health Infostructure was to "identify and prioritize issues, challenges and barriers to the effective use of information technologies and systems in a Canadian health infostructure and recommend coordinated approaches and

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equipment, and patient records; (2) a patient loop, which would allow individuals, wherever they are located, to access the healthcare system for home health care, health maintenance, patient-initiated assessment of treatment, and data on treatment alternatives and providers, and also to extend the reach of health care to rural communities; and (3) a claims processing loop" (Diebold Institute, 1995, p. 13).

solutions" (Noseworthy & Watanabe, 1999, p. 240). In its final report, the Advisory Council recommended active support for and use of information tools by health professionals (Noseworthy, et al., n.d.). At a provincial level, the Auditor General of Alberta and the Ontario Health Services Restructuring Committee are two examples of organizations which have advocated for improved health information management in Canada (Hooper & Sinclair, 1998a; 1998b; Valentine, 1997).

Practitioners have also recognized the importance of information management and integration for the health care system. In 1998 the Canadian Medical Association's Political Action Committee recommended that the federal government budget an additional $3 billion for health care, some of which was intended to be spent on establishing a transparent, clinically-driven health information infrastructure (Borsellino, 1998). The Canadian Nurses Association, in 1998, started development of a Canadian Nursing Knowledge Network (http://www.cna-nurses.ca/pages/press/knowledge_management_key_to_nursing's_future.html) to support evidence-based nursing practice and continuing education.

At the same time as a Canadian health infostructure was being discussed and developed, barriers became evident in areas such as systems standardization, privacy and confidentiality, governance and funding, and political agendas. These challenge health infostructures at all levels of government (i.e., regional, provincial/territorial, and national) and most have solutions unrelated to the technology itself. In fact, Anderson, Aydin and Jay (1994) have suggested that 45% of medical information system implementations fail for purely non-technical reasons such as staff resistance, even in the absence of significant technical problems. In more general terms, approximately 70% of

business process reengineering efforts fail (Levine, 2001). As early as 1971, Gorry and Morton reported that "researchers in the field generally feel the most important implementation problems are human and organizational" (p. 13) (also see Vimarlund, Timpka & Ljunggren, 1998; Worthley, 2000). At the very least, there is evidence that the context in which information and communication technologies are implemented plays an important role in determining the outcomes of implementation (Kling, 2000).

If policy can be used to resolve many of these non-technological issues, it is clear that government can facilitate or hinder the development of a Canadian advanced health information infostructure. Moran (1998) has recommended that government "should err on the side of caution in the face of policy options that would have the effect of materially retarding the development and dissemination of major improvements in the nation's health information infrastructure" (p. 20). Clearly, health information policy makers, chief information officers, and others working in this area need to understand the complete spectrum of factors influencing health information system implementation, not just the technological factors, and to carefully consider each before proceeding with a particular project.

For example, "virtual" patient records, records that exist in "aggregate form simultaneously populated from multiple locations" (Forslund & Kilman, 1996), may enhance the accessibility of the health system, the quality of care delivered by the system (e.g., reduced testing duplication, drug interaction, targeted patient education), and the system's ability to measure population health. Government can support or impede development of such systems through policies relating to information technology standards, a primary health care system, and health information protection and privacy,

all of which have sociopolitical implications. In the case of primary health care, for example, the scopes of practice and inter-professional relationships of the various professions (e.g., physicians, nurses, social workers, rehabilitation professionals, etc.) may be influenced. In the case of health information protection and privacy, professional and public goals and values are important, and in the case of technology standards, a basic consideration is the standards in use already. The conceptually simple goal of virtual patient records is thus integrally related to a number of other policies and sociopolitical interests.

As another example, policies often have implications for health infostructures. With widespread government adoption of new public management principles there is a general trend towards citizen-oriented government and public accountability (Pal, 1997; Scharitzer & Korunka, 2000). Policies supportive of public consultation and accountability could fundamentally change the relationship between actors in the health care system and consumers. This is a direction in which the Alberta government signaled its willingness to move when it legislated the election of RHA members on October 15, 2001 (see http://www.health.gov.ab.ca/rhas/Elections/index.html). Other strategies, facilitated by health infostructure, could include online feedback and consultation (which the Alberta government has employed in other areas, see http://www.albertaconnects.ab.ca) and even online patient access to medical records. However, these strategies also require careful consideration of a number of sociopolitical factors, including privacy and confidentiality, development of appropriate output and outcome indicators (meeting the needs of consumers as well as other healthcare

stakeholders), and strategies to synthesize and utilize feedback within the healthcare system.

Research Questions

This study was conceived as a means of exploring the sociopolitical challenges to the development and implementation of integrated health information systems. The objectives were to identify future avenues of research and also to assist health information system stakeholders critically examine the social and political factors of their own environments.

The case that was examined was that of Alberta We//net,[3] the program that the Alberta government initiated in 1997 to develop a province-wide health information network. The following research questions were asked:

1. What social and political factors have influenced the reactions of Alberta We//net's stakeholders to the program's implementation?
2. What policies have been adopted by We//net and Alberta Health to address the challenges presented by these social and political factors?

Alberta We//net's stakeholders include but are not limited to: physicians, nurses, pharmacists, other health care providers, government, health researchers, information technology (IT) professionals, and Alberta's RHAs.

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[3] "Alberta We//net is the umbrella for a series of multi-stakeholder, information technology initiatives to improve: (a) the health of Albertans and the quality of their care; and (b) the management of Alberta's health system" (http://www.albertawellnet.org/slideshows/update032001/sld004.htm).

Significance

This study is significant for several reasons. While there is no scarcity of writing about the implementation of integrated information systems in health care, there is a noticeable lack of research in this area. Most reports are anecdotal and of institutional-level implementations, usually in the United States (Aydin & Rice, 1991). Alberta We//net represents a larger scale implementation than many others reported in the literature and is a Canadian case. It is important to study health information system implementations in the Canadian context because of the fundamental differences between the Canadian and American health care systems (such as universal coverage and a larger share of public funding in Canada). Additionally, this study examined an aspect of information system implementation that is of great importance but is less reported in the literature: the reactions of stakeholders to information systems and how these are influenced by political and social factors.

In general, an interdisciplinary social informatics perspective on information management and information technology issues was adopted (Kling, 2000). Social informatics is the "interdisciplinary study of the design, uses, and consequences of information technologies that takes into account their interaction with institutional and cultural contexts" (p. 218).[4]

This case study was exploratory in the sense that it did not test theory or develop new theory; however, this exploratory and descriptive approach was appropriate given

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[4] For an overview of social informatics see http://memex.lib.indiana.edu/siwkshop/SocInfo1.html.

the paucity of existing studies in the area. The findings were intended to suggest further research and also to benefit policy makers working in this domain.

Outline

This report, as is standard for academic theses, is organized into a number of chapters. Chapter 1 provides the rationale and background for the study. Chapter 2 reviews the literature that informed the design of the study and supported interpretation of findings and development of conclusions. Chapter 3 summarizes the activities and structure of the Alberta We//net program (while a more complete description of We//net's initiatives is provided in Appendix 4). Chapter 4 describes the methodology and methods that were used in this study, and also comments on some of the methodological limitations. Chapter 4 concludes with a general framework for the findings, which are then discussed in more detail in Chapters 5 and 6. Chapter 7 considers what conclusions may be drawn from the study. This document concludes with a reference list, copies of the instruments that the study employed, background information about Alberta We//net and Alberta's political system, and summaries of the themes that emerged from the study and the documents that were reviewed (Appendices).

Chapter 2: Literature Review

This study was informed by research into, and reports of, health information system integration and implementation. The relevant literature often focuses on the goals of health information systems and the technical variables that affect the outcomes of their implementation. The positive outcomes that the literature suggests for health information systems are discussed below as "the promise" of these systems. The factors that determine how well outcomes are achieved are discussed as "the challenges". Expected outcomes and challenges are, of course, inextricably linked.

The Promise

The goals of health information systems depend very much on the scale of the system implemented. For instance, whereas national health infostructures may have as their main goal population health surveillance, regional systems may be more focused on implementing electronic patient records. Given that the focus of this study was a provincial health information system, the literature review emphasized studies of systems of that size. However, as has already been mentioned, there are few reports in the literature of implementations on this scale; also, health information systems on other scales do appear to share some of the same goals as provincial health information systems. Consequently, studies of differently scaled implementations were also included in the review. The suggested benefits of integrated health information systems are summarized in the following sections.

Cost management. The Auditor General of Alberta and other bodies such as the Alberta Management Committee on Drug Utilization consider integrated health information systems to be an essential part of health care expenditure management

(http://www.ualberta.ca/~adup/documents/Annual2000.doc; Valentine, 1997). In a more general sense, it has been suggested that integrated health information systems can be used to track patients and the resources used by those patients across regions, thereby allowing health care payers to manage costs and improve health care quality (Bates, et al., 1999; Kovach, 1999).

Care management. "[Care] management software provides a single point of data capture and access for a wide range of client information in the provision of public health services" (Lewin Group, 1998, p. 21). The two aspects to this are usually considered complementary: point-of-care data collection and network-wide access to patient records (Kovach, 1999). The common element is an electronic medical record that is accessible to a number of groups of health care workers and relevant to each (Anderson & Jay, 1990). Worthley (2000) considers systems with this functionality to be the highest order of health information system, terming them "fully integrated systems" (p. 48).

The first component of a care management system, point-of-care data collection, allows providers to capture information at the point of care, that is, at any point they are with a patient. This functionality potentially has great benefit in terms of the accuracy of data that is captured and the currency of data that can then be accessed by the system's users.

The second component of a care management system, network-wide access, requires some form of shared clinical record or universal medical record that can be a single record or a virtual record drawn from different sources (Shneiderman, 1997). For instance, the TeleMed system developed by the Advanced Computing Laboratory at Los Alamos National Laboratory in New Mexico created "a virtual patient record that allows

the integration of databases from multiple clinics and multiple providers across geographically separated areas" (Kay, et al., 1998, p. 465). Similarly, the CareWeb system of Boston's Beth Israel and Deaconess Hospitals used the World Wide Web to consolidate health information from multiple legacy computer systems and present it as an integrated virtual record (Halamka, Osterland & Safran, 1999). The advantage of virtual patient records is that they permit contributing organizations to maintain control of their own patient records while benefiting from the sharing of patient information from diverse sources and across geographical boundaries.

Care management may also include shared patient scheduling and referrals (Kovach, 1999; Mousin, Remmlinger & Weil, 1999; Teich, 1998). In Finland, for instance, a system was developed to support the health system's reorientation to a continuity of care model. Integral to this was "on-site care and treatment of a patient regardless of which healthcare centre a patient [visited] and regardless of where patient data [was] stored" (Karhunen-Lappalainen, 1997, p. 54). Other anticipated benefits of care management include seamless care for patients, lifelong medical records for all of a region's residents, and 24-hour access to patient information (National Health Service Information Authority, 1998). Care management is a commonly desired outcome of health information system integration (Karhunen-Lappalainen, 1997; Kovach, 1999; Mousin, Remmlinger & Weil, 1999).

Cost-efficiency and organizational effectiveness. Dickson (1998) has suggested that integrated systems are more efficient and less expensive than other systems that are protected by firewalls and other secure barriers. In industries other than health, the Committee on Enhancing the Internet for Health Applications, et al. (2000) suggested

that "as information is distributed efficiently to those who need it when they need it, lines of control and influence become clearer, and individual units often self-organize in new and more effective ways." The Committee's report mentioned two cases where the use of Web-based applications resulted in significant efficiencies: in one case a consumer-oriented site reduced visits to physicians' offices by 11 percent, and in a second case a teleradiology system reduced the time needed to return radiology reports from 72 hours to four hours.

Decision support and clinical reminder tools. "Decision-support and outcomes products now being developed are expected to incorporate both internal financial and clinical data across the continuum of care, as well as external sources for comparative information" (Mousin, Remmlinger & Weil, 1999. p. 49). Decision support tools can be clinically, administratively, or policy focused (Kovach, 1999). Systems are being developed that will automatically analyze patient records for decision support and quality control purposes (Anderson & Aydin, 1998). Anderson (1999) has said that "efforts to influence physicians' clinical decisions are important because these decisions generate more than three-quarters of all healthcare costs. Moreover, there is evidence that alerts and reminders can significantly improve patient care" (p. 62) (see also Lovell & Celler, 1999).

Health promotion and population health. With data integrated and accessible, policy makers would have, in essence, a population health information system built on the foundation of a medical treatment information system (Lasker, Humphreys & Braithwaite, 1995). Such a system can be used to plan, coordinate, and evaluate health promotion efforts, and support health research (Shortliffe, 1999).

Alvarez and Zalamar (1998) have suggested that information systems can benefit population health and health promotion efforts through

(a) development of mechanisms for improved surveillance of emerging diseases by public health authorities;

(b) creation of longitudinal personal health records and mechanisms to facilitate authorized access to information by patients/clients and health service providers;

(c) support for emerging health service priorities, such as pharmacare and home care; and

(d) continued development of additional content as required (including an increased emphasis on information needed to support a population health focus and evidence-based decision making).

Some health information systems also make available consumer-focused information, applications, and communication tools. In the United States, the Public Health Data Policy Coordinating Committee stated that "the extent to which population-based health can achieve its mission depends, in large part, on the effective collection, analysis, use, and communication of health-related information " (Lasker, Humphreys & Braithwaite, 1995, p. 4). The need for data that can be integrated at different geographic (e.g., province, region, community) and other levels (e.g., socioeconomic status, disease state) was identified by the Canadian Institute for Health Information (1998) in their report on health information needs in Canada. The report outlined also the need for two kinds of data linkage:

1. Linkage of information on population health to determinants of health. This will require development of core standards, and indicators for data flow.

2. Linking of service utilization and population health information at the community/regional level to enable micro data analysis of needs, usage patterns and health issues for purposes, planning and optimization of access and services delivery (p. 9).

Value-added features. The first step in many health information system integration efforts is the development of a network that supports such rudimentary productivity applications and "value-added" features as email. However, more developed systems can support more advanced communication applications such as telemedicine and teleconferencing. Telemedicine initiatives have been established without integrated health information systems but the benefits of linking the two are obvious. The convergence of the two kinds of systems may render them inseparable and components of the same "record". Teleconferencing allows health care workers in different cities to meet without traveling (Committee on Enhancing the Internet for Health Applications, et al., 2000). Distance learning and learning on demand, as in the case of isolated, rural physicians, is a potential benefit of teleconferencing and telemedicine applications (Committee on Enhancing the Internet for Health Applications, et al., 2000; Lasker, Humphreys & Braithwaite, 1995). Also, specialists in urban settings can use these applications to support health care providers in remote settings.

Others see value-added items such as email, access to clinical knowledge bases (e.g., electronic textbooks and bibliographic databases), and other forms of clinical information (e.g., practice guidelines, protocols, and care maps) as being important to the success of an integrated delivery system (Kovach, 1999; Mousin, Remmlinger & Weil, 1999; Teich, 1998; Zielstorff, 1998). In their health informatics assessment of Alberta physicians, Noseworthy, et al., (n.d.) found that while the most frequently used informatics applications were business support applications (e.g., billing and scheduling), still up to 20% of respondents used clinical support applications such as literature searching and continuing medical education resources. Of the resources to which Alberta

physicians wanted immediate access, literature searching ranked second.[5] There appeared "to be a preference for acquisition of 'clinical-support' applications, while 'business-support' software [prevailed] in current use." The British National Electronic Library for Health (http://www.nelh.nhs.uk/) is an example of one such "value-added" health informatics application (Gray & de Lusignan, 1999).

Disintermediation. Disintermediation, the end result of removing middlemen from transactions, is only one of the many effects that the Internet has had on global business. As the Committee on Enhancing the Internet for Health Applications, et al. (2000) observed, book suppliers and book buyers now deal directly with one another across the Internet (e.g., Amazon) and "business-to-business" is an increasingly common buzzword. In theory, disintermediation is a positive change because it maximizes consumer choice while minimizing supplier overhead (e.g., by eliminating middlemen and providing greater control over inventory). The long-term effects of this trend on our society remain in question, but the same trend may have positive outcomes for health care. For example, the British National Health Service (NHS) has implemented the NHS Direct patient information service, the goal of which is an informed public and immediate and convenient information access (Wyatt, 1998). NHS Direct includes an interactive guide to treating symptoms (theoretically reducing demand on healthcare providers) and also phone links to a 24-hour nurse-led help line (http://www.nhsdirect.nhs.uk/about/). Using the service, consumers can self-diagnose and treat minor complaints, but for more serious concerns they are directed to an appropriate healthcare professional.

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[5] Slightly fewer than 50% of the respondents wanted immediate access to such resources.

The Challenges

The factors that are reported in the literature as affecting the outcomes of health information system implementations are reviewed here as challenges to implementation. They might also be called "critical success factors". Terminology aside, they represent barriers to health information systems implementations and the factors that this study expected to find in the case of Alberta We//net. The challenges discussed here are those that might be expected to be generalizable to provincial health infostructures.

Receptivity and leadership. Receptivity is the ability of stakeholders to accept a new health information system and appears closely related to what the Committee on Enhancing the Internet for Health Applications, et al. (2000) have also identified as a necessary ingredient for any health information system integration effort: leadership. The Committee has suggested that "when applications require complex interactions across—and potentially beyond—the organization, the skills and talents of individual participants must be augmented by strong institutional leadership and a shared vision of what the organization is trying to accomplish." Shortliffe (1999) suggests that problems with technical leadership and planning account for much of the frustration resulting from the use of IT in health care. To the extent that Canadian health infostructure initiatives, crossing provincial and intra-provincial regional boundaries, exhibit attributes of other forms of organizational networks, Pedler (n.d.) has suggested that leadership, accountability, and the complexity of governance relationships may be problematic.

Individual leadership of an implementation is also important. For instance, Frisse (1999) has found that "leaders of technology initiatives are often enthusiasts" or champions; Sinclair and Hooper (1998b) have suggested that provincial health

information systems "will have to be built from the bottom up with the full support and enthusiastic participation of the full spectrum of 'players' in the field." Champions, or leaders, are essential to such "grassroots" and multistakeholder initiatives.

Receptivity may also be influenced by other factors, such as lack of standards (i.e., the resources that stakeholders have to expend in this area for a system to become operable), concerns about confidentiality and security, or cost and governance issues. The perceived value of infostructure to stakeholders will influence their receptivity, as will stakeholder past experiences (Brenner & Logan, 1981). This latter factor, for example, appeared to have influenced the development of Britain's national health information strategy. For instance, the National Health Service Information Authority (1998) has commented that "over the past decade, the combination of apparently distorted priorities and the high-profile failures of IM&T implementation has seriously undermined the support of the clinical community for a national information strategy" (http://www.nhsia.nhs.uk/strategy/full/6.htm).

Receptivity may relate to an organization's ability to change or to recognize the potential of integrated systems and change to maximize benefit that accrues from adoption, what Allard (1998) terms "cultural readiness". "Hesitancy to change may result from legitimate organizational concerns as well as organizational inertia" (Committee on Enhancing the Internet for Health Applications, et al., 2000). Alpay, Needham, and Murray (2000) reviewed a number of studies of nurses' responses to information systems and found that in general they have "mixed and ambiguous attitudes towards the use of computers and information technology" (p. 6). Even the U.S. Air Force, implementing

various change initiatives, met with mixed success which it partly ascribed to "cultural problems within the groups affected by the change" (Barlow, 2000, p. 17).

Provider accountability. Systems that collect data about provider activities and share them with health care policymakers, administrators, and others can be used to make providers more accountable for their decisions. It has been observed that physicians "perceive information technology as a tool for bringing [their] behaviors under close scrutiny" (Alberta Medical Association, 2000). Armstrong and Armstrong (1999) have argued that while evidence is clearly critical for health decision-making it can also be used to undermine professional judgments.[6] Other staff and health care providers may resist the implementation of integrated health information systems for similar reasons (Anderson, Aydin & Jay, 1994; Aydin & Rice, 1991).

Privacy, confidentiality, and security. Privacy, confidentiality, and security[7] are essential and much-contested factors with any large-scale public information system. While data users (i.e., government, health care administrators, researchers) see great value in integrated information systems, the public and others often express the fear that

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[6] "Evidence may be used to develop formulas for care that ignore context, eliminate choice, and provide a basis for denying care" (Armstrong & Armstrong, 1999, p. 1204).

[7] "Privacy is the right to be let alone, to be free from interference, from surveillance and from intrusions. . . . To protect privacy in a health context could mean not collecting information at all. Confidentiality implies a trust relationship between the person supplying the information and the individual or organization collecting it. . . . Confidentiality assumes information has been provided. Security is the technology or administrative arrangements organizations use to prevent confidential information from being disclosed. It too assumes there is information to protect" (Phillips, 2000).

individuals' health records will be shared inappropriately and with the potential to cause harm. The challenge is to develop a "framework that would protect the privacy of individuals while permitting critical analytic uses of health data" (Lasker, Humphreys & Braithwaite, 1995).

Privacy, confidentiality, and security have technical and policy dimensions. For instance, security can be addressed technically using encryption and user validation methods and also by policies that determine who has access to records (Denley & Smith, 1999; Halamka, Osterland & Safran, 1999; Pinner, 1998). In Alberta, there was a very active and very public debate about the introduction of legislation (i.e., Freedom of Information and Privacy Act and The Health Information Act) in the later 1990s (Alberta Health, 1997b). Noseworthy, et al. (n.d.), found that 57% of Alberta physicians considered privacy concerns to be a major or moderate barrier to their use of informatics applications.

Cost factors. Despite the predictions of some experts who claim that a move to integrated health information systems can, in the longer term, save money, there are others who claim that the savings come not through IT integration alone but instead "through operational integration to reduce overhead costs and increase efficiency" (Mousin, Remmlinger & Weil, 1999, p. 50). Integrated systems can cost "$40 million or more, and annual operating costs can amount to 10 percent of initial acquisition costs" (Mousin, Remmlinger & Weil, 1999, p. 50).

Individual physicians also consider the cost of information systems to be a barrier to their uptake (Noseworthy, et al., n.d.) and may be further discouraged from adopting systems because present regulations will not reimburse them for some of the work that

they do with the systems. For instance, most professionals are not reimbursed for work that they do at a distance using telemedicine applications (Committee on Enhancing the Internet for Health Applications, et al., 2000). In general, "the return to health care organizations on investments in Internet-based applications are not yet clear" (Committee on Enhancing the Internet for Health Applications, et al., 2000). Frisse (1999) has remarked that "information systems are expensive not because of their purchase price, but because they often don't save their sponsors money or their practitioners time" (p. 1304).

Standards. Standards are necessary for data transmission and also coding and classification (Anderson & Jay, 1990; Lasker, Humphreys & Braithwaite, 1995). While one of the goals or outcomes of health information system integration is a shared clinical record, implementing such a system is costly "because of the need to integrate and standardize data from disparate systems" (Mousin, Remmlinger & Weil, 1999, p. 48). Typically, the task of combining data from existing legacy systems is difficult (Teich, 1998). Developing standards requires time, money, and organizational commitment and can have particular requirements in terms of hardware and software (Anderson & Jay, 1990). In particular, standards development can be disaffecting for certain groups (Mousin, Remmlinger & Weil, 1999). In general, technical and professional standards, as well as laws and regulations, may be barriers to the implementation of health information systems (Committee on Enhancing the Internet for Health Applications, et al., 2000; Lovell & Celler, 1999).

Meaningful data. Anderson and Jay (1990) found that medical data may need to be summarized in order to be useful to physicians. The information required by other groups could conceivably be compromised by such summarization or the summarization

may require developments in other areas (e.g., standards) before data useful to all of the various stakeholders can be made available. Bates, et al. (1999), have suggested that "depth, comparability and accuracy" of data are critical success factors for all system users, and that "for comparisons to be meaningful, it will be necessary to get the members of the network to agree about how to compile individual measures" (p. 119).

Workforce. There are a number of potential workforce barriers related to information systems. The first barrier is the ability to attract the technical staff that can support the systems and extend them into the future. This question of technical staffing may be an issue in Canada because the public sector pays less than the private sector for IT positions. Thus the public sector may not be able to attract the numbers and caliber of staff that a more online and integrated health system requires. Even if adequate staff are available, new staff represent additional system costs.

Second, health care professionals, administrators, and policy makers need to be able to work with the resulting systems. Training and change management become issues here, in addition to the already mentioned barrier of provider accountability (Allard, 1998; Alpay, Needham & Murray, 2000; Ball, 2000; Levine, 2001; Shortliffe, 1999). The U.S. Public Health Service's Public Health Data Policy Coordinating Committee has commented that one barrier to use of information systems by the public health sector is "a public health workforce that lacks essential information technology skills" (Lasker, Humphreys & Braithwaite, 1995). Anderson and Jay (1990) have noted that physicians accept applications that enhance their "patient management capabilities" but oppose those that "infringe on their decision making role" (p. 305). Also, applications intended to be used by a variety of health care groups may compromise on features in favour of

particular groups. Given that each group will have its own operational characteristics and culture, this may cause friction amongst the groups and lead to dissatisfaction with the resulting system (Vimarlund, Timpka & Ljunggren, 1998).

Also, the introduction of information technology into any environment will often result in changes in relationships amongst providers, patients, and payers and changes in work practices (Alberta Medical Association, 2000; Alpay, Needham & Murray, 2000). Most large-scale health information systems use the Internet as a backbone and the Committee on Enhancing the Internet for Health Applications, et al. (2000) has commented that "the Internet is altering the traditional roles of and relationships among patient, primary care provider, local specialist, and tertiary hospital specialist."

Summary

In summary, the major benefits of integrated health information systems would appear to be: their ability to support improved and "seamless" patient care; improved information for cost management; the cost-efficiency of integrated systems and their capability to improve organizational effectiveness; enhanced decision-support; disintermediation; and various value-added capabilities, such as telemedicine and digital libraries. In general, the benefits relate to improved patient care and efficiency of the health care system, and greater accountability. The major challenges to the development of such systems, as reported in the health informatics literature, would appear to be: organizational receptivity and leadership; privacy, confidentiality, and security; cost containment; technical standards; various data quality issues; and workforce issues.

Chapter 3: Background

Frisse (1999) has used the term "complex information ecosystem"[8] to describe the situation of medical information systems in academic medical centres. How much more complex then is the We//net program, the scope of which includes all of Alberta's RHAs and thousands of health care workers? The program itself might be viewed as one subsystem of an even more complicated Canadian health information ecosystem.

To clarify this situation, the following discussion briefly summarizes the development of We//net (see Noseworthy, McAllister & Bader, 2001 for a more detailed history). The program's organizational structure is outlined in Figure 1. A more detailed summary of We//net's initiatives and their status as of summer 2000 is provided in Appendix 4 (which also includes a detailed timeline identifying the landmark stages in We//net's development and some of the key events in the larger health information ecosystem).

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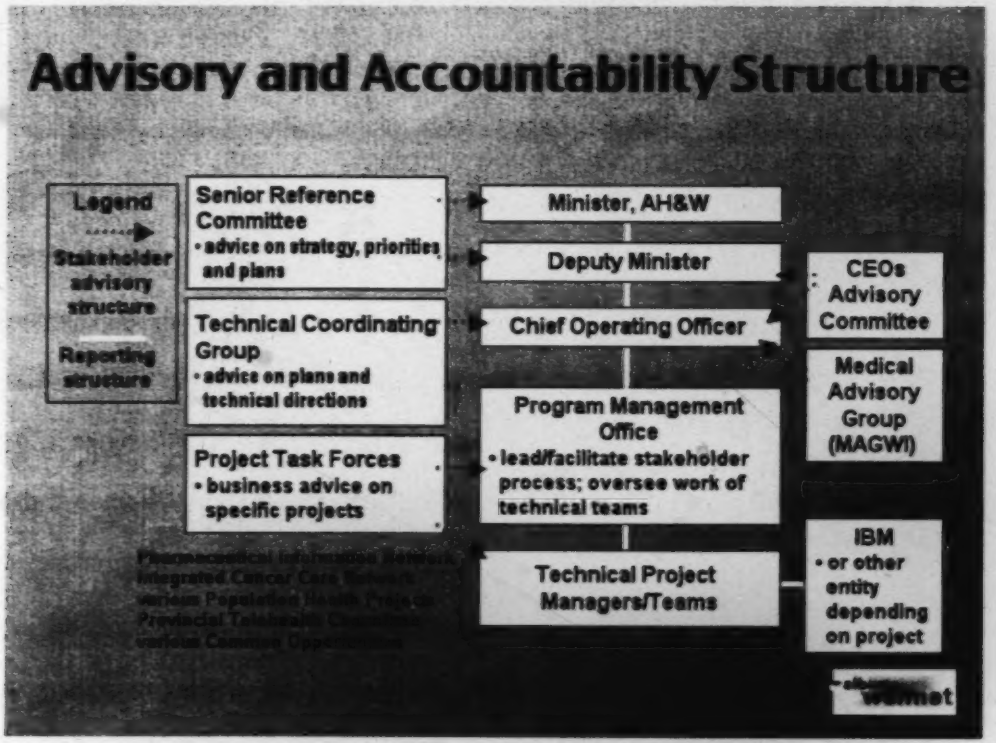
[8] The information ecosystem has "different components, each serving a community directly while working in concert with other components to produce a cohesive, balanced information environment. Like nature's ecosystem, an information ecosystem must be adaptable, changing as the inhabitants and participants within its aegis change. Over time, the balance between different components and their relationship to each other changes as well, as the environment changes. Sometimes the effect will appear on seemingly unrelated parts (sometimes disastrously!). Adaptability, change, and balance, are the hallmarks of the components of a healthy information ecosystem" (Inmon, Imhoff & Sousa, 1998, p. 2).

Figure 1. Alberta We//net advisory and accountability structure



Note: Figure reproduced from http://www.albertawellnet.org/slideshows/update032001/.

"Alberta We//net is the umbrella for a series of multi-stakeholder, information technology initiatives to improve: (a) the health of Albertans and the quality of their care; and (b) the management of Alberta's health system" (http://www.albertawellnet.org/slideshows/update032001/sld004.htm). The program's goal is to provide infrastructure and tools that enable the exchange of information across the health system. The program was launched in January 1997 under the leadership of Minister of Health, Halvar Jonson. However, individuals interviewed as part of this study credited three other leaders with the initial vision of Alberta We//net: Tom Noseworthy, Chair of the University of

Alberta's Department of Public Health Sciences; Mary Gibson, Assistant Deputy Minister (ADM), Health Information and Accountability Division, Alberta Health; and Jack Davis, Deputy Minister of Health.

Noseworthy, an internist and critical care physician, had extensive health policy experience and vision as evidenced by his past roles as Chair of the Steering Committee of the Prime Minister's National Forum on Health and as President and Chief Executive Officer (CEO) of Edmonton's Royal Alexandra Hospital. Gibson, a Chartered Accountant, assumed her position in August 1996 following eight years with Alberta Treasury and extensive past experience with Touche Ross & Co. and other consulting firms. During her tenure as ADM, Gibson was also Co-chair of the Advisory Committee on Health Infostructure,[9] a Board Member of the Canadian Institute for Health Information, a Board Member of HEALNet (http://hiru.mcmaster.ca/nce/), and the Ministry's Chief Information Officer. Gibson left her position as ADM on June 6, 2000 to take a position as ADM, Consumer and Corporate Services, and shortly thereafter she moved back to the private sector. Davis was appointed to his position in June 1996 from Deputy Minister of Alberta Transportation and Utilities. He left the Health Ministry in July 1997 to take a position as Deputy Minister of Executive Council.

One interviewee suggested that Jack Davis arrived at Health with the general idea that one of the Ministry's projects would be a health information network. The Ministry's

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[9] "The Advisory Council on Health Infostructure was established in August 1997 by the federal Minister of Health to provide advice and recommendations on the development of a comprehensive Canadian health infostructure" (http://www.hc-sc.gc.ca/ohih-bsi/chi_ics/achi_ccis_e.html).

first movement in this direction was to contract Ernst & Young to assess the state of Alberta's health information management and health information technology. The Ernst and Young report, released in late 1996, stressed the need for a comprehensive, incremental, and fully inclusive approach to health information processes in Alberta. At the same time the Ministry launched the first stage of the Health Information Act (e.g., consultation, discussion documents) and started recruiting a Chair for We//net's Senior Reference Committee (SRC) (see Figure 1).

The program's SRC was intended to sit apart from the envisioned Technical Coordinating Group (TCG) and project committees that would concern themselves with technical and operational details; the goal of the SRC was instead to advise the Minister of Health on We//net strategy and planning. Tom Noseworthy was the person recruited to Chair this committee and the SRC was established in February 1997. Membership of the SRC, and the supporting TCG, included representatives from the health professions, health authorities, and university Faculties of Medicine. In June 1997 IBM was selected as the program's strategic alliance partner to develop the We//net blueprint and tactical plan, and Ernst and Young was selected as the program's quality assurance partner.

Once the program was underway and strategic planning initiated, Bill Arnold was hired as the program manager, to be replaced in that role by John McAllister.[10] McAllister later became the Chief Operating Officer of the We//net program reporting to

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[10] Mr. McAllister, a Chartered Management Consultant, had a strong project management background and had previously been involved in a number of large provincial infostructure and information system projects.

the Deputy Minister of Health. However, from the time of Jack Davis' departure in 1997, the program essentially had two interim co-sponsors in the persons of Tom Noseworthy and Mary Gibson. A series of Deputy Ministers of Health (Don Ford, Lynn Duncan, Shelley Ewart-Johnson) relied on the continuity of contact provided by ADM, Mary Gibson. Interviewees reported that Jack Davis continued to provide guidance to We//net when his advice was sought. Dan Bader joined Alberta We//net as CEO in February 1999 which clarified the situation of We//net's leadership considerably. Although Bader, as Deputy Minister responsible for the Alberta Government's Strategic Information Technology Initiatives (and later Deputy Minister of Municipal Affairs), had responsibilities other than We//net and reported to the Minister of Science, Research and Information Technology, on matters relating to We//net he also reported to the Minister of Health.

The program's strategic plan was developed by 1998 and subsequent to this a master plan outlined 43 potential We//net projects, unconstrained by time or resources (Noseworthy, McAllister & Bader, 2001). From these 43 potential projects, nine key initiatives were chosen (see Appendix 4), according to a priority-setting process framed by the Health Ministry's four strategic goals[11] and using a variety of weighted and consensus-derived criteria. Project development and implementation proceeded from the resulting plan. The status of the initiatives as of summer 2000 is described in Appendix 4.

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[11] The four strategic goals were to promote the health and well-being of Albertans; to improve access to the health system; to optimize the quality and utilization of health services; and to improve the health system's management and accountability (Alberta We//net, 2000c).

Chapter 4: Methods and Results

Case Study

This study was conducted as a qualitative instrumental case study, an approach that is typically used to gather rich data about a bounded system such as a program or process (Creswell, 1998).[12] Case study promotes a multi-method research approach that may include quantitative and qualitative data elements, although it is more often considered a qualitative approach. By combining different methods to study the same subject the researcher is able to identify common themes amongst the different data sets, a process called triangulation. Case studies commonly include interviews, surveys, document analysis, and observation as means of data collection. However, "case study is defined by interest in individual cases, not by the methods of inquiry used" (Stake, 1994, p. 236). The individual case that was considered for this study was We//net.

"The more the object of study is a specific, unique, bounded system, the greater the usefulness of the . . . [case study] rationale" (Stake, 1994, p. 237). We//net appeared initially to be a bounded situation. It was, and is, a program of Alberta Health and Wellness and, as is described in Appendix 4, its initiatives are clearly identified. However, within the boundaries of the particular case, researchers can explore all dimensions of the case, or they can focus on particular questions or dimensions. Stake (1994) has commented that

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[12] The term "case study" can be somewhat misleading. The approach used in this study should not be confused with the approach commonly used in business and other education programs for teaching purposes (Stake, 1994).

> not everything about the case can be understood—how much needs to be? Each researcher will make up his or her mind (p. 238).

For the purposes of this study, the variables identified in the research question (i.e., sociopolitical factors influencing the reactions of stakeholders) were thought to be rich and interesting dimensions for exploration.

An instrumental case study approach was used. This implies that the subject of the research (or the issue) rather than the case, is the primary focus of the study. In this case, We//net was not thought to be a unique case nor even the primary interest of the study; it was instead "a vehicle to better understand the issue" (Creswell, 1998, p. 250), that issue being the social and political factors influencing the implementation of a province-wide health infostructure.

There are a number of more particular reasons that the case study methodology was selected for this research project. In general, as a predominately qualitative approach, case study is ideal for describing "the motives, perceptions and assumptions of individuals and groups, [and] the dynamics and processes of complex human organizations and institutions" (Boulton & Fitzpatrick, 1997). It has also been suggested that this methodology is ideal for evaluating the political and social outcomes of information systems implementations (Anderson, Aydin & Jay, 1994; Aydin & Rice, 1991). Case study has been used in many informatics and IM/IT studies with good result (Anderson, Aydin & Jay, 1994; Aydin & Rice, 1991; Lee, Leibenau & DeGross, 1997; Myers, 1988; Vimarlund, Timpka & Ljunggren, 1998).

Chenail (2000) has said that qualitative methods may be most appropriate for curiosity-motivated research.[13] A qualitative approach was chosen because the study was, more than anything, curiosity-driven. The researcher was aware of research in some related settings and was curious if the same themes would emerge on a larger scale (i.e., in the We//net case).

Qualitative case studies are also appropriate for studying technological situations with a high degree of variability, which was the case with Alberta We//net. Despite a short timeline, it is certain that elements of the implementation plan and strategic objectives of We//net, and its policy environment, changed during the study. Gorry and Morton (1971) have suggested that "process research in implementation . . . often is a single case study with non-random selection and a sample size of one (a few exceptions have included data collected systematically from a number of individuals in a single case study)" (p. 14). Case study was therefore a reasonable method to use in this instance as it accommodates changing situations and players.

Methods

As has already been mentioned, the case study method is characterized by multiple sources of information (Creswell, 1998) which are used to triangulate findings (i.e., identifying the same theme from different sources or data sets increases the validity of the study's findings). Three different information sources were used in this study:

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[13] Chenail considers curiosity to be only one stance that a researcher can take in relation to a subject. For instance, to confirm a hypothesis he suggests that a quantitative approach should be adopted. To change a situation, he suggests that an action research approach may be most appropriate.

semi-structured, open-ended interviews; primary documents detailing the activities of the program (e.g., annual reports, internal documents, government documents, newspaper articles);[14] and the research literature.

A semi-structured questionnaire guided interviews with a sample of key informant We//net stakeholders, a method of data collection described by Rossman and Marshall (1995) as "elite interviewing". "Elite individuals are considered to be the influential, the prominent and the well-informed people in an organization or community and are selected for interviews on the basis of their expertise in areas relevant to the research" (p. 83). Interviewing the complete population was not possible (i.e., the study's time and resource constraints prevented more comprehensive interviewing), therefore a "snowball" sampling technique that relied on contact with one interviewee leading to introductions with others was used. The study focused on an "elite" as it was expected that these would be the individuals with most insight into We//net's policy environment and the system-level reactions of We//net's stakeholders. Interviewees in some cases acted as key informants (see Gilchrist, 1992) in that they provided information through mechanisms other than formal interviews (e.g., in some cases they shared information through personal documents and informal comments).

The sample (n=11) included We//net managers, representatives of health care professions, health administrators, and government policy-makers (see Table 2). Interviews, conducted over summer, fall and winter 2000, ranged in length from 45 minutes to over an hour. Snowball sampling was continued until new themes ceased to

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[14] Primary documents that were reviewed are listed in Appendix 6.

emerge from the data. A continuation of the study might employ a survey tool and a larger sample of stakeholders.

Table 1: Interviewee details.

Interviewee Roles	Organizational Perspective			
	RHA	We//net	Alberta Health	Professional Association
Health practitioners	1	1	2	2
IT	1	2	1	2
Administrative[15]	2	4	3	1

Note: In total, 11 individuals were interviewed for this study. The number indicated in the table exceeds 11 because most of the interviewees had multiple role or organizational perspectives in relation to Alberta We//net.

All interviews were recorded on minidisk and transcribed, and informed consent was sought before any data was collected. Data was only used to answer the research questions stated above. Ethics approval for the study was sought from Capital Health's Health Research Ethics Board B (Health Research) and this was granted on May 31, 2000.

Data Analysis

Standard techniques were used to analyze the data: describing the case; categorizing topics within the data; developing naturalistic generalizations; and finally

[15] Administrators constituted government employees at the Director level and above, and individuals from other organizations in roles such as Chief Executive Officer, Regional Director, and Program Director.

presenting the data and findings. Member checking was used, as suggested by Creswell (1998), to verify quotations and descriptions with the interviewees.

The case description was built upon published and unpublished source documents (see Appendix 6). The purpose in doing this was largely to communicate the setting of the We//net program in order that others might judge the applicability of the study's findings to other settings.

The remainder of the data analysis used the NUD*IST (i.e., Non-numerical Unstructured Data Indexing Searching and Theorizing) program which allows researchers to manage and analyze qualitative data, by searching and coding themes. For example, any interview responses relating to loss of autonomy as a result of We//net were identified and coded consistently. Themes were tested against the data by looking for instances when the theme did not hold true.

The themes were then extended as naturalistic generalizations, meaning that lessons that may be applicable to other settings were articulated. These were not articulated as theory but instead as practical lessons for other policy makers. The outcome of this process was a series of narratives including the case and research descriptions, thematic analysis (i.e., findings), and conclusions.

Conceptual Framework

Anderson, Aydin and Jay (1994) have discussed three conceptual models of change used by evaluators of information systems. These include one model that views the information system as an external force that is imposed on an organization by management, and a second model that views the system as a design resulting from an analysis of user needs. The third model, and the model that was used in this study, views

the outcomes of a health information system implementation as the result of a complex mix of social and political processes. "From this viewpoint, predicting organizational change resulting from information systems requires an understanding of the dynamic social and political processes that occur within organizations as well as the characteristics of individuals and the information system" (p. 10). Individual attitudes towards new information systems may be created "through interaction with others and through membership in a common social context" (Aydin & Rice, 1991, p. 120). More recently, these authors have indicated that research into the social impact of health information systems might examine any of three domains: professional roles and practice patterns; professional relations between individuals and groups; and patients and patient care (Anderson & Aydin, 1998). Although this study cast its net widely, in reality it focused on the first two of these three domains.

Limitations

This study had a number of limitations, including bias and access to informants. Study limitations affect such things as generalizability and validity of findings. The study's limitations are discussed here in order that the discussion of findings may be properly interpreted and the conduct of future studies may be improved.

The researcher had some personal biases that were carefully considered throughout the course of the study. For instance, he had some preconceived notions about how certain We//net stakeholders might respond to the program. These stemmed from his formal education, his work experience implementing health information applications in various settings, and also from his reading of the literature in this field. These biases were minimized by triangulating findings and by remaining aware of these biases. Given the

time limitations of the study, it was not possible to validate findings with others (e.g., by having a second researcher analyze the data) which might have also helped to reduce personal bias.

Another potential bias was introduced by the "snowball" sampling technique. With contact with one informant leading to contact with others, it is possible that informants referred the researcher to others sharing their point of view. Triangulation with the literature and documentation was again an important check against this source of error.

A third limitation to the study was the time limitations of the researcher himself. Stake (1994) has suggested that case studies require researchers to place themselves "into the thick of what is going on" (p. 242). This might have been done in this case by attending meetings (e.g., We//net committees, MAGWI meetings, etc.), spending time in the We//net offices, and attending We//net meetings with the RHAs. This was not done because of time limitations, however this observational data set would have undoubtedly given the study more depth. Whether there are themes that remain uncovered because of this is uncertain. This limitation was partially addressed by sharing a draft of this study with interviewees and soliciting their feedback. Interviewees did offer suggestions and clarifications which were incorporated into the study's findings and conclusions.

Access to interviewees was less of a challenge to the study than anticipated. Most informants who were contacted agreed to be interviewed (only two who were approached did not agree to be interviewed). The greatest difficulty in arranging interviews was in scheduling meeting times; in some cases it took months to arrange meetings.

A more serious potential limitation to the study rests with the interviewees themselves. As has already been mentioned, interviewees were mostly "elite" individuals. It is difficult to say how much the power differential between the researcher and the interviewees affected the responses and the questions that were asked. The researcher was very aware of the power differential and, as an individual already working in Alberta's health informatics and evaluation sector, this may have influenced how the interviews were conducted.

It is also difficult to gauge the level of disclosure of the interviewees. On some topics interviewees seemed guarded, as was to be expected (e.g., inter-professional issues), but for the most part interviewees appeared open and quite willing to talk about the We//net program. However, even interviewees who seemed very frank and open may have had their own agendas in mind. Marshall and Rossman (1995) have suggested that in interview situations where the researcher clearly has much less power than the interviewees, it is important to engage them with "provocative, open-ended questions that allow them the freedom to use their knowledge and imagination" (p. 83). Whether this was the case in this study is also uncertain.

In using the elite interviewing approach as this study did, it was not surprising that the concerns of less powerful groups in the health care system did not emerge from the interviews. No representatives of potentially impacted yet less powerful groups (e.g., clerical workers, front line professionals and paraprofessionals, healthcare consumers) were interviewed. In future, attempts to construct a more complete picture of the factors influencing reactions of all stakeholders to a provincial health information system such groups should be considered.

A final limitation of the study was the small size of the sample population. While one goal of the research was to identify social and political factors that might be important in other settings, We//net may be unique in many respects and other social and political factors may come into play in other settings. For this reason, the findings are weak in terms of generalizability to other settings, although generalizability was strengthened through triangulation with the literature.

The small size of the sample also suggests that the findings may not be not generalizable to We//net stakeholders as a whole. That is, while the existence of certain social and political factors is *suggested* by these findings, assumptions cannot be made about their relative importance to each of We//net's stakeholder groups. However, this study was not intended to lead to scientifically representative findings; it was intended to be question-generating, exploratory, and descriptive from the outset. Also, Stake (1994) suggests that with case study, "the reader comes to know some things told, as if he or she had experienced them. Enduring meanings come from encounter, and are modified and reinforced by repeated encounter" (p. 240). Consequently, an important determinant of the "generalizability" of this case is the extent to which findings and conclusions resonate with the reader and are reinforced by the reader's subsequent experience.

Results

Often, case study findings are presented in the form of a case study narrative. In this case, however, the narrative of We//net's development was not the object of the research, and so it is presented separately from the research findings (see Chapter 3 and also Noseworthy, McAllister & Bader, 2001).

As described above, interviews and documents were examined and data relating to social and political factors were coded. This was an iterative process in which data was coded and re-coded multiple times as patterns emerged. Factors that seemed related were scrutinized and in some cases merged, recoded, further dissected, or renamed. Factor names were often suggested by the data itself (e.g., if an interviewee used a term that seemed appropriate then that might be used to name a factor) or the literature (e.g., the "organizational inertia" name was suggested by the literature). A number of factors emerged from the data analysis to reinforce and expand those identified in the literature review. A wide array of social and political factors were identified that may have influenced the reactions of We//net's stakeholders to the program; a number of policies of Alberta Health and Wellness and We//net that addressed the challenges presented by these social and political factors were also identified.

Factors were then grouped into more general categories to facilitate reporting but it is recognized that these categories are not necessarily mutually exclusive, nor do they represent a theoretical framework. The general categories were: a) exogenous factors, b) business factors, c) professional factors, d) information policy, and e) process attributes. The first four groups of factors might be termed contextual factors (i.e., policies and sociopolitical factors outside the program's control) (Schacter, 2001); process attributes relate primarily to the processes employed in We//net development and implementation. The relationships among factors were not tested by this study and consequently represent an area for future research.

The factors are presented in Table 2. Ideally they would be mutually exclusive, and while in reality some of the factors may be viewed in isolation, most are inextricably

linked with others. The contextual factors are considered in chapter 5 while the influence of process attributes on stakeholder reactions is considered in chapter 6. Appendix 7 compares these themes with those that emerged from the literature review at the outset of this study.

Table 2: Emergent themes.

Group	Factor	Number of Interviewees[16]
Exogenous factors	Geography	2
	Organizational inertia	4
	Organizational problems	1
	Past experience	2
	Regionalization	4
	RHA size	1
Business factors	Competition	2
	Cost to stakeholders	10
	Human resource burden	5
Professional factors	Accountability	5
	Autonomy	5
	Evidence-based practice	3
	Liability	1
	Professional evolution	2
	Relationships	8
	Scope of practice	9
	Threat to Profession	3

[16] The number of interviewees represents the number who felt that the factor influenced the reaction of Alberta We//net's stakeholders to the program. Where interviewees felt that the factor was not present in the We//net case, this is indicated in the analysis of findings.

Group	Factor	Number of Interviewees[16]
Information Policies	Privacy and confidentiality	8
	Secondary uses of information	2
	Shared information access	10
Process Attributes	Consensus building	6
	Governance	8
	Leadership	10
	Participation	10
	Private sector involvement	4
	Timing of benefits and deliverables	9

Chapter 5: Contextual Factors

The contextual factors that were identified in interviews and We//net documents represent those factors that were beyond We//net's immediate control. For example, We//net could not change the fact that regionalization had happened shortly before the program was initiated. However, leadership approaches (a process attribute, discussed in the next chapter) were within We//net's control, as were other factors like governance (although this was perhaps more in the control of Alberta Health and Wellness) and the program's consensus decision-making approach.

Exogenous Factors

A number of factors were identified that potentially influenced stakeholder reactions to We//net yet were largely external to the program or outside the control of the program. That is, factors influenced We//net that had no direct or obvious relationship to We//net.

Geography. Two interviewees identified two geographic factors as potential challenges for We//net. Interviewee J[17] suggested that the rivalry between Alberta's two major cities (or "the Calgary-Edmonton dialectic") could have been problematic for We//net. This rivalry is one of the major axes of Alberta politics in the 20th century and a frequent story in national and provincial newspapers and magazines ("A tale of two cities", 2000; Bergman, 2001). Given that Calgary and Edmonton are the two largest

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[17] Interviewees are identified consistently by a letter of the alphabet in order that readers have a better sense of the source of comments. Interviewee professions and organizational affiliations are not reported in order to safeguard their anonymity.

RHAs in the province[18] it seems likely that perceptual and receptivity problems might have developed had one Region developed more influence with the program. For instance, were the Calgary Health Region to be seen to have more influence, then Capital Health (and other Regions) might have been less receptive and willing to contribute financially to the program. However, the interviewee felt that We//net dealt with this, largely through balancing the two Regions' representation across the program's committees; that is, the Calgary Health Region and Capital Health were represented equally on the program's committees.

A related factor is Alberta's rural-urban division. Interviewee A suggested that this factor did influence the We//net implementation. The interviewee said, "I've been to a number of meetings and whenever We//net sets up a committee it's got representation from Calgary, David Thompson, and Capital, and then they throw somebody else in, like one or two people representing the rural health authorities." Interviewee J suggested that rural physicians felt alienated from We//net, particularly when We//net partnered with the College of Physicians and Surgeons of Alberta (the physicians' regulatory body), in addition to the Alberta Medical Association, to conduct a physician needs survey. These factors were not identified by other interviewees nor were they identified in the literature.

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[18] The two RHAs are Capital Health (which includes Edmonton and surrounding area) and the Calgary Health Region. Calgary's total funding for fiscal year 2000-2001 was $833,679,604 whereas Capital's funding for the same time period was $889,618,712 (http://www.health.gov.ab.ca/rhas/funtable.htm). The region receiving the third greatest total funding in 2000-2001 was the David Thompson Health Region with $165,940,865.

Organizational inertia. At its outset, We//net recognized "that the health system stakeholders [were] diverse, [had] differing priorities, [were] in various stages of readiness to link with others, and [could] move at different paces" (IBM, n.d., p. 8). Jack Davis, shortly after assuming the position of Deputy Minister of Health, engaged the independent management consulting firm, Strategic Value Services, to survey Alberta Health's stakeholders. One key message that the survey reportedly identified was a demand for leadership from the Ministry. As interviewee I commented, "Much as people rail against the heavy hand of the central authority, if there isn't some leadership there it's really hard to get things organized and make things happen. So, people would prefer to have leadership." From this early stakeholder consultation, it was apparent that there was a need for leadership from Alberta Health and Wellness.

As with many other themes, organizational inertia appears closely related to We//net's leadership in the sense that it was a barrier to the program's development that leadership had to overcome. Noseworthy (1998) identified organizational ability and willingness to act, which this study characterizes as organizational inertia, as one of the key challenges to the development of Alberta's provincial health information system.

Interviewees suggested that We//net had to move the health system in Alberta from its traditional perspective on information management to a more modern perspective; that is, cultural change. Interviewee A commented, "It's moved us, it's provided the impetus, that, despite the problems we've encountered, it's sort of like saying, 'Ok guys, this is the 21st century . . .'" Interviewee H commented on the We//net leadership's "evangelical" approach to disseminating their message. Interviewee A suggested that We//net had to move the Regions from a view of information management

as computers to one of a system of effective information interchange and information utilization (i.e., computers being one component of a more holistic organizational mindset). The interviewee commented that information management, as a result of We//net, became an integral part of regional processes. However, this was clearly a struggle for the program; We//net and its supporters had to work hard to have this message heard, understood, and internalized.

Interviewee A also suggested that for proponents of a more holistic vision of information management, We//net was very beneficial in that the program served as a decoy, and was the loud-voiced group that was heard by regional leadership (as opposed to proponents at a regional level who reportedly saw themselves as "voices in the wilderness"). "They [went] in front of the CEOs, they [went] in front of Alberta Health and promoted information management when, you know, you don't listen to your own employees." Interviewees also said that the program championed and enabled health information management and de-stigmatized investment in information technology. Interviewee J commented that while We//net may not have had this more holistic vision at the program's outset, it did catalyze, through its emphasis on information services, the development of a vision for information management in the province.

The Medical Advisory Group to the We//net Initiative (MAGWI) (see Figure 1) is one example of We//net's impact on stakeholder information management perspectives. MAGWI formed outside of We//net's advisory committee structure in response to a

perceived physician leadership vacuum in the project.[19] We//net itself encouraged this development, not wanting to replicate professional structures within the program. The Alberta Medical Association has commented that "MAGWI was established to provide policy advice to Alberta We//net, and develop actions to advance the use of IM/IT in the physician community and methods to communicate with physicians about IM/IT" ("Opening the file on IM/IT", 2000, p. 13).

From We//net's perspective, "the big thing [was] to start to get their [i.e., MAGWI's] heads around what [is] information management from the context of the medical community? What [were] the technological solutions to support that information management strategy? And how [could] we broadly put that in the medical community so that it [could] interact with We//net and some of these other things." MAGWI was a sounding board for We//net's leadership and also one mechanism for disseminating We//net's vision to the physician community. Interviewees reported that early on in the program it was realized that if MAGWI could be made to understand We//net's vision, then this vision could be more readily communicated to the wider physician community. Interviewee J suggested that at the program's outset information management was not on the agenda of any of the professional Colleges. MAGWI was one tool for changing that perception.

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[19] It is also interesting to note that the MAGWI served multiple purposes for stakeholders and We//net. For instance, although the group provided leadership to physician-associated We//net initiatives, it also provided physicians involved in We//net initiatives with opportunities to interact with their peers and discuss ideas.

One strategy that We//net used to earn the trust and support of MAGWI's physicians was, for example, to send key physician leaders to health informatics conferences. This strategy had the benefit of helping the physicians to develop an understanding of current health information technology and information management. One of the outcomes of developing this knowledge and perspective was MAGWI's development of a funding proposal to the Canada Health Infostructure Partnerships Program, a process which interviewee D likened to a formal declaration of the "mechanism for . . . transitioning physicians to knowledge [managers], to information managers." Clearly We//net's objective of transitioning physicians, or at least certain key physicians, to a more sophisticated understanding of information management was achieved.

Interviewee J commented that what MAGWI became interested in was a way to change how physicians thought of themselves with respect to knowledge and evidence. It was suggested that this was a more lasting and enduring impact for the group than a more reactive "watchdog" approach to We//net initiatives that might been have taken. This suggests that We//net not only had to overcome the inertia of Alberta's health care organizations but also of its professions. "The most important part [was] the change management and helping the physicians through a transition," as the interviewee suggested.

Aside from MAGWI, interviewee A suggested that a general strength of We//net was its ability to lead and develop projects that were outside the mandate of other health system stakeholders. The program was able to act as a broker and bring stakeholders together on projects where there was no clear mandate for other stakeholders to carry

them forward. For instance, the interviewee reported that We//net's Common Opportunities project changed behaviour and brought organizations together, to the point where they now seek more common opportunities. "Now they want to leverage more of their own money and try and get more money and so we get more and more of those types of projects."

Organizational problems. If an organization is experiencing problems before the introduction of a new information system, it seems likely that the problems will not diminish and may in fact be exacerbated by the introduction of the new system. Interviewee A described a situation wherein a RHA representative was given responsibility for a particular aspect of a We//net initiative without the representative's prior approval or knowledge. This created serious workload problems for that person and for the Region. However, the interviewee suggested that this was not an issue with We//net but instead was the Region's "own organizational problem where there was little communication." System implementers may be unaware of and unable to compensate for such pre-existing organizational problems but these are clearly factors that may influence stakeholder reactions. No other interviewees identified this factor.

Past experience. The past experience of stakeholders with initiatives similar to We//net emerged as a theme in only one interview. That said, it is perhaps an important factor for consideration when developing these kinds of information system initiatives. Interviewee J made reference to previous efforts to develop a health information utility in Alberta. "And absolutely from a physician point of view nothing came of it, so a big hurdle that We//net had to get over was the crying wolf phenomenon. There have been many, many . . . efforts to get physicians excited—nothing ever happened. Somehow they

surmounted that." One interviewee suggested that this was not by accident; We//net had anticipated this factor and accounted for it in its program strategy. Past experience was not mentioned as a factor by other interviewees nor was it mentioned in any of the documentation that was reviewed; however, it was mentioned in the literature review (National Health Service Information Authority, 1998).

RHA size. Interviewee A made several references to the influence that organizational size had on stakeholders' abilities to manage We//net initiatives and consequently their response, favourable or otherwise, to the initiatives. In the interviewee's opinion, We//net was more directive with smaller RHAs and the interviewee also felt that smaller RHAs were under-represented in We//net committees (see the previous comment under *Geography*). The interviewee suggested that the smaller RHAs also typically have smaller IT staffs and consequently less capacity to handle aggressive We//net deadlines. However, it should be noted that the Ernst & Young report (1996) identified this as a consideration for We//net when it noted that "all regions require similar functionality, but differ significantly in scale, ability to invest, and ability to operate" (p. 15). Clearly We//net was aware of this challenge.

Regionalization. Regionalization had a pervasive influence on the We//net implementation and the reactions of stakeholders to the program. It was mentioned as a factor by four interviewees, representing We//net, government, and provider perspectives. Interviewee D mentioned that following regionalization in the early 1990s, the RHAs were "trying to find their role, trying to establish their role, carve out more of a role . . . so you introduce something like a We//net into the pot and nobody really knows how to control them [i.e., Alberta We//net]." As a result, Regions may have been less receptive

to We//net than they might have been under a more established and familiar health system organization.

Interviewees also suggested that regionalization affected the relationship between the Regions and the Ministry of Health, which limited We//net's ability to take a directive role within the health system. Interviewee I suggested that this directly influenced the collaborative, voluntary approach to participation that We//net adopted. While the Ministry might have had the legal authority to mandate the RHAs' participation in We//net, "the feeling was that the Ministry had lost, if you will, the moral authority to tell people what to do. It was a much softer, inclusive, bring people to the table, we'll do this by consensus kind of approach. Probably right for the time."

However, in some ways regionalization may have also increased Regional receptivity to the We//net program. One interviewee suggested that it should have increased receptivity to the extent that integrated health delivery depends on integrated health information exchange. This comment was echoed by interviewee I who said that the Regions recognized that "if [they] were going to occasionally send patients back and forth it would be nice if [they] had some of these things [i.e., information systems] in common." Regionalization also appears to have influenced how We//net was funded. This is discussed below under *Cost to stakeholders*.

Business Factors

We//net's influence on health business influenced stakeholder reactions to the program. This was a strong theme in the interviews. It could be argued that these factors are economic, rather than social or political factors, but they are included here as related non-technological influences on We//net's stakeholders.

Competition. Two interviewees (H and B) identified We//net's potential to influence stakeholders' business competitiveness as a factor in the program's implementation. However, this factor was identified more as a potential challenge to implementation than an actual challenge. The factor appeared in relation to the inclusion of cost information in the Pharmaceutical Information Network (PIN). One interviewee commented that pharmacy owners were sensitive to the inclusion of cost information if it was to be shared with other health care providers. Although there are potential benefits to the inclusion of such data in PIN (e.g., physicians might be better able to judge which medications to prescribe to their patients, particularly those on restricted incomes), interviewees suggested that pharmacy owners were concerned that this would compromise their "competitive edge." The second interviewee suggested that "there's some sensitivity on the part of pharmacists for competitive reasons . . . If that information is available to any pharmacy then it would provide some competitive advantage, so that's an area of sensitivity." Competition, in an economic sense, does not appear to have been an issue with stakeholder groups other than pharmacists.

Cost to stakeholders. Perhaps not surprisingly, the influence of We//net's costs on stakeholder reactions emerged as one of the strongest themes in the study. Also not surprisingly, this theme emerged from the document review as well as the majority of the interviews.

In general, politicians (as evidenced by their recorded comments in Hansard) seem to have been concerned mostly with We//net's deliverables in relation to the program's cost (i.e., they were not so concerned with the cost itself, which in terms of

other government infrastructure projects was not exceptional).[20] For example, Gary Dickson, an opposition Member of the Legislative Assembly (MLA),[21] on February 18, 1998, asked specifically what Albertans would be getting for their expenditures on We//net. Alberta's Auditor General (Valentine, 1998) also emphasized the program's need to communicate, meet expectations, and manage costs when he acknowledged the risk of cost overruns with the program. He commented on the fact that We//net was entering "uncharted waters" and that "across North America, information systems developments in all sectors have a high failure rate in meeting budgets and user needs" (p. 139). At the same time, he recognized that the value of the program to the province was not in doubt.

The perspective of other stakeholders was somewhat different. Although government was the most significant payer for We//net from its inception, Alberta Health and Wellness fostered RHA ownership of the initiative by funding the program with volunteered regional funds as well as direct funding from the Ministry. For instance, in 1999-2000 Alberta We//net received $19.7 million from Alberta Health and Wellness and $15 million from the RHAs (Alberta We//net, 2000c). Other sources brought the total funding for the program up to $36.2 million. The contribution from the RHAs was, according to interviewees, voluntary (and not all Regions did contribute).

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[20] Total spending by Alberta Health and Wellness in 1999/2000 was $5.46 billion (Alberta Ministry of Health and Wellness, 2000). Spending on Alberta We//net, by the Ministry and RHAs, represented approximately 0.66% of this total.

[21] See Appendix 5 for a brief discussion of Alberta's political system.

This voluntary aspect of the funding model was mentioned several times by interviewees. They suggested that it was in fact one of We//net's primary challenges. Interviewee G suggested that the RHAs were upset with the model because they were not sure "how much of this [was] We//net telling [them] what to do and how much [was the RHAs] telling We//net what [they] needed." Other interviewees expressed some confusion with the model, apparently not clear as to its intended outcomes. Interviewee K suggested that the model "could have brought [Alberta We//net] down and still might."

Non-RHA stakeholders may have also been less receptive to We//net as a result of the cost of participating. For instance, a number of interviewees remarked that a barrier for participation in We//net initiatives was the capital investment required to participate (e.g., hardware and software upgrades, new systems, staff training not directly related to We//net applications, etc.). The program recognized this as a key challenge in its April 2000 Operating Plan update (Alberta We//net, 2000d). One strategy adopted by We//net, in the case of the physicians' office systems, rather than paying physicians to upgrade infrastructure, was to implement a delivery mechanism that reduced this barrier. In this instance, We//net absorbed some of the costs at the outset and passed maintenance costs to physicians through the use of an application service provider (ASP) model (Alberta We//net, 2000d).[22] As interviewee J commented, "I think that We//net has been

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[22] "An application service provider (ASP) offers access to applications, as well as the associated IT infrastructure and support services, to customers on a subscription basis. ASPs host applications at a remote data center and deliver them to customers over private networks or the Internet" (http://www.nwd.mb.ca/services/ABCofASP.htm).

advocating for physicians by saying to Alberta Health that if it wants a big change . . . then it's going to have to absorb upfront costs. At the same time everyone's been saying, including MAGWI, that if you give anything to the physicians for free it won't be valued. So the current model is . . . physicians handle all the maintenance cost, which in an ASP model is a lot of the cost."

Also, We//net clearly made the correct decision in agreeing to reimburse physicians for their participation in the program's committees and meetings. Recognizing that other non-physician participants in these meetings were reimbursed by other means and that reimbursement was a substantial issue for the profession, interviewees reported that We//net absorbed these minor costs and created much good will as a result.

Another cost-related challenge for We//net was the apparent expense of the program. "Information system implementation is very expensive . . . in terms of what the man in the street thinks it would cost," as interviewee E remarked. Noseworthy (1998) predicted that a propensity of stakeholders to underestimate the costs and overestimate the benefits would be a significant risk to the program. Also, the possible discrepancy between the investor and the beneficiary from the investment (e.g., as in the case of telehealth initiatives) was identified as a risk. Interviewees indicated that the program's deliverables were usually intangible up until the moment that stakeholders were able to use the applications, which was another challenge. That is, stakeholders could see money being spent on We//net but could not see the return on their investment. Interviewees suggested that during strategy and transitional stages of the We//net program, nothing was being delivered to stakeholders and consequently RHAs may have thought that the money that they were contributing to We//net could have been applied more directly to

solve their own information technology problems. Interviewee I suggested that government should have injected more money into We//net from the very beginning and that the failure to do so hampered the implementation of the program (in terms of timing of deliverables); that is, funding did not necessarily match expectations as it was implemented incrementally. Several interviewees said that the annual capitalization of the program was a direct result of government risk aversion and that this challenged the program. Interviewee I commented that "it's very tough to do some of these things incrementally. It would be better if you said, 'Ok, over the next four years we're going to implement We//net, that's a $500 million tab and maybe we'll pay for it over the next ten to fifteen.'" This theme is discussed in greater detail below as *Timing of benefits and deliverables*.

Interviewees also acknowledged that cost avoidance was an incentive to stakeholder involvement in some instances. The Common Opportunities initiative[23] was one such case that a number of interviewees mentioned as a substantial early success for the program. The success of this first initiative, and its timing with the Y2K issue, may have helped We//net to develop the relationships and position in Alberta that it needed to implement some of its more challenging applications.

Cost issues also affected, as did regionalization, the stakeholder participation model that was chosen.[24] For instance, interviewees suggested that had We//net been able

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[23] Common Opportunities was one of We//net's earliest and more successful initiatives. It was a program of joint IT procurement by two or more RHAs (see Appendix 4 for more details).

[24] Interviewee D commented that "participation's twin brother is funding."

to pay more of stakeholders' costs then the program would have been able to take a more directive approach with certain initiatives (e.g., Seniors Drug Profile and PIN). Instead, the program, influenced by fiscal necessity, adopted a voluntary strategy that allowed them to share some of those costs with the stakeholders. As interviewee D commented, "We [i.e., We//net] don't have the ability to pay providers to use our tools. Our philosophy and our mandate is, 'We'll build good tools. You use them as you see fit.'"

Human resource burden. Human resource burden, closely related to the previous factor[25], was mentioned as a challenge for We//net implementers by five interviewees. Three types of human resource impact were identified, including

(a) the impact on smaller RHAs (with smaller technical staffs with which to implement new projects);

(b) the impact, on physicians and pharmacists in private practice, of added work requirements resulting from implementation of new systems; and

(c) the challenge of providing computer training to health care professionals.

Four of the interviewees suggested that other factors, such as financial costs and privacy issues, were much more significant challenges to the program.

Professional Factors

Professional factors were defined as those attributes of organizations or professions that were affected by Alberta We//net and, as a result, influenced the reactions of those groups to the program. Professional factors ranged from the often

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[25] This factor may be considered a particular example of the "cost to stakeholders" factor, differentiated only by the nature of the cost (i.e., personnel time rather than monetary).

benign and gradual change that happens to professions over time, to the more dramatic inter- and intra-professional debates and conflicts over scope of practice and new healthcare paradigms. For the most part these issues are long term, are issues with many health care projects (i.e., not just health information technology), were not resolved during the period of this study, and will probably continue to be issues that We//net stakeholders wrestle with for the duration of the program.

Accountability. One of the business imperatives established by consensus among the members of We//net's Senior Reference Committee and the Technical Coordinating Group included enhancing "accountability among the health system stakeholders with inputs, outputs, outcomes, standards, measures and targets for service" (IBM, n.d., p. 2). Karen Leibovici, an opposition MLA, in a 1999 address to the Legislative Assembly, commented that We//net was one of the initiatives then currently underway to improve the accountability and performance of the health care system. Furthermore, Alberta Pharmaceutical Association President, David Heggie, and College of Physicians and Surgeons Assistant Registrar, Paul Flynne, commented that We//net would be useful in reducing drug misuse and abuse (Geddes, 1997; Thorne, 1997). Clearly, improving the accountability of the health care system was a major objective of We//net's and the program continues to be seen as the mechanism by which the "up-to-date and complete health information" may be collected to manage the system and to support improved accountability.

Interviewees were probed to determine if We//net had been perceived as a tool to enhance accountability of the professions, or to allow groups other than the professions themselves greater access to information about individual practitioners and groups of

practitioners. Most interviewees suggested that this had not been an issue with the program although several felt that it had the potential to become one. Only one interviewee, interviewee C, felt that physicians were concerned about increased accountability, suggesting that they were concerned about other groups and other physicians examining their individual practices (e.g., specialists examining the practice information for family physicians). Interviewee I suggested that accountability was not a challenge because stakeholders were focused on issues other than We//net (e.g., health information legislation).

Autonomy. Professional autonomy, "the assurance that individual [providers] have the freedom to exercise their professional judgment in the care and treatment of their patients" (World Medical Association, 1987), was mentioned frequently in the interviews. Three interviewees reported seeing no evidence that stakeholders felt their autonomy was influenced by We//net. "I don't know if autonomy is directly affected with the [We//net] applications," remarked interviewee A. Interviewee D suggested that stakeholders "should be thinking about that because quite frankly . . . one of the things that we will see when we put in things like PIN, it <u>will</u> change the standard of practice."

However, five interviewees suggested that providers <u>were</u> concerned about the influence that We//net might have on their professional autonomy and they indicated that while stakeholders appear to have been uncertain <u>how</u> We//net would affect their autonomy, the perception that it <u>might</u> do so seems to have influenced their reactions to the program: "They [i.e., health care providers, RHAs, and professional organizations] are worried about the fact that We//net might change the political landscape and if they

can't control that then they get out . . . if they can't control them then they don't necessarily want to support them."

Changing political and organizational structures and personalities may have also exacerbated whatever uncertainty stakeholders had about the newly introduced health information program. For the RHAs, regionalization possibly aggravated their concerns about autonomy since they were still trying to determine their role at the time We//net was introduced; and, as interviewee J commented, "I think there's a fear amongst the physician community that We//net being based within Alberta Health and not having more independence is dangerous, [and] the recent changes [i.e., the change in Alberta Health leadership in 2000] that have occurred in the government leadership has made everyone wonder how stable We//net is, can it be depended on?"

Evidence-based practice. While interviewees commented that providers were concerned that We//net's potential as a clinical practice guideline implementation mechanism represented a threat to their professional autonomy, they also suggested that We//net's support for evidence-based medicine[26] was welcomed by professionals. Alberta We//net's vision, "better information for better health", appears supportive of this approach to health care, although not necessarily in the short term. However, We//net has initiated a relationship with the Alberta Clinical Practice Guidelines Program and two

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[26] Evidence-based practice is an approach to health practice that promotes "the best available evidence, moderated by patient circumstance and preferences . . . applied to improve the quality of clinical judgments" (McKibbon, Wilczynski, Hayward, Walker-Dilks & Haynes, 1995).

interviewees commented that We//net could serve as a guideline implementation and quality assurance mechanism in the longer term.

Interviewees suggested that a major incentive for stakeholder involvement in We//net is that it will eventually provide better information for better decision making. The phrase "better decisions" appeared in We//net's vision in relation to doctors, public health officials, and health administrators. Richard Marz, a Government MLA, commented in the Alberta Legislature on January 28, 1998 that "We//net will do much to address concerns across the health care system for timing and accurate information that is needed to improve the health of all Albertans and the management of the health system." The incentive for stakeholder participation in We//net was improved decision making at all levels of the health system: providers, RHAs, and government.

Liability. The theme of liability arose in only one interview, in relation to the nursing profession's reaction to Alberta We//net. Interviewee G felt that with We//net becoming a permission-driven system, patient permission for data sharing will need to be collected. The interviewee suggested that "nursing knows from experience who is going to be doing this." In addition to the perception that this might detract from nurses' clinical responsibilities (i.e., be a workload issue), the interviewee felt that this might also be a liability issue. This theme did not arise in the course of other interviews nor was it identified in the document review.

Professional evolution. The health professions are constantly evolving and pharmacy is perhaps the one most obviously in a state of flux at present. Pharmacists as a profession feel that the health care system does not allow them to meet their full potential ("Pharmacists in primary…", n.d.). The National Forum on Health (1997) suggested that

changes to the modern health care system may allow pharmacists to finally "leave dispensing to technicians, and become more involved in professional services and direct patient care." Given that the pharmacists struggled with their identity throughout the 1990s, it seems likely that this was a factor in the profession's reaction to We//net. Two interviewees suggested that it was a factor. However, it is unclear just how this influenced the reaction of the profession and the one key document[27] that might have assisted in this regard was not available for review (i.e., the document was made available only to members of the Pharmacists Association of Alberta).

Relationships. Eight interviewees suggested that a number of relationships were impacted by the We//net program, influencing stakeholder reactions to the program. Two of these were mentioned in interviews: inter-professional relationships and patient-provider relationships. Interviewees suggested that changes to patient-provider relationships might also influence providers to adopt We//net applications in the longer term.

As was mentioned in the literature review, inter-professional relationships are potentially one of the greatest challenges to health information system implementations and interviewees from each stakeholder group raised this as an issue. The challenge appeared to be with applications such as PIN which promote the sharing of information (in this case, information sharing between physicians and pharmacists). While interviewees reported that most providers do generally see value in information sharing

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[27] *RxA's Position Statement on alberta we//net and the Pharmaceutical Information Network (PIN)*. http://altapharm.org/association/search/TextSearchResults.cfm?p_ID=778

and working together, they also suggested that the challenge lies in the details of the information shared. Interviewee F said that information sharing was one of We//net's objectives, "to promote the communication and the interdisciplinary kind of activities that go on." However, a number of interviewees said that this challenge had not been resolved and that a satisfactory solution would probably require a substantial period of time. One interviewee suggested that deciding who gets to see what in the patient record will be a "big, big problem" but that in terms of We//net at the time of this study, this was still very much a potential situation.

Many of the interviewees mentioned that while provider relationships remained a substantial potential challenge to the program (or, more accurately, to certain of the program's initiatives, such as PIN, that entail this kind of change to inter-professional relationships) none of the program's initiatives were advanced enough at the time of the interviews that it had yet arisen. It appears that this "specter" did not interfere with project planning because there had "been good working relationships between the various leaders and the stakeholder organizations in understanding the issues." Interviewee D suggested that the real impact of the technology in terms of inter-professional relationships would not be felt for several years.

In terms of relationships with patients, We//net's focus was, at the time of this study, on provider applications (i.e., delivering information to providers). So, while there was a sense that in the longer term We//net would facilitate certain types of provider-patient communication (e.g., diabetic monitoring at home) the more obvious communication between providers and patients was not happening with We//net (e.g., simple electronic communication between patients and providers). That is not to say that

it will not happen in Alberta, because at the time the of this study Calgary was considering a system called Health Connection while Capital Health implemented Health Link telephone information service in September 2000. Interviewee E suggested that this kind of patient-provider communication would be driven by the Regions and providers themselves, rather than We//net.

Interviewees also reported that patient-provider relationships have the potential to increase providers' uptake of We//net applications. For instance, several interviewees suggested that as patients become more and more familiar with information management their expectations of providers will increase. However, this is a very long term factor that represents a fundamental change in the nature of patient-provider relationships and it is difficult to predict how this will unfold in Alberta and how this might influence reactions to We//net.

Scope of practice. Scope of practice is a concept closely allied to professional autonomy and in fact most professions seek to maximize both scope of practice and autonomy. Scope of practice refers to the range of roles, functions, responsibilities, and activities in which a particular health care profession may engage (Thompson, 1997). In Alberta, scope of practice at the professional level is legislated, but professions may seek to expand their scopes of practice, where appropriate. While the vision of Alberta We//net does not include changing the scope of practice of the province's health care professions in any way, there is always the potential for information technology to support or facilitate changed scopes of practice, and a number of interviewees suggested that there was an expectation that We//net would do so. Of the nine interviewees who mentioned this factor, seven used We//net's PIN as an example of how this might happen.

One of PIN's goals is to support communication among doctors, pharmacists, and patients to help improve the quality of patient care. While interviewees suggested this is attractive to pharmacists in that it potentially allows them greater access to patient medication profiles, it may not be as attractive to physicians. Pharmacists have promoted the idea that they can and should be more accountable for the patients under their care (Anderson, 2001). It is often suggested that in addition to being reimbursed for dispensing pharmaceuticals, Alberta pharmacists should also be reimbursed for "cognitive services" which might include calls to patients at home, patient education, and physician feedback. Allowing pharmacists greater access to patient information (e.g., diagnosis) via PIN could facilitate the profession's efforts in this direction. At the same time, We//net is potentially a threat to pharmacists in that it has the potential to put more prescribing tools in the hands of physicians (e.g., drug interactions software). However, interviewees reported that in general, the potential of reimbursement for cognitive services (exemplified, perhaps, in the Alberta Drug Utilization Program's Trial Prescription "Checkpoint" Program) was an incentive for pharmacists' involvement in We//net that outweighed this potential barrier.

Interviewee A also suggested that a number of other professional groups (e.g., nurses, physiotherapists) feel that working with computers takes away from providing a direct service and that in general they find it to be more paperwork. The interviewee suggested that this perception influenced the reactions of individual professionals to Alberta We//net but no evidence was found of a more general professional reaction in this regard.

Despite the foregoing, there was a sense that scope of practice issues were not significant factors in the early stages of PIN or Alberta We//net in general. As interviewee I remarked, "we had a lot of major issues to deal with in We//net but that wasn't a major one. Until you got into the later stages of the Pharmacy Network."

Threat to profession. In using the elite interviewing approach as this study did, it is not surprising that the concerns of less powerful groups in the health care system may not have emerged from analysis of the data. No representatives of the less powerful groups potentially impacted by We//net programs and applications (e.g., clerical workers, health care paraprofessionals, patients) were interviewed. However, interviewee A made the following comment in relation to this factor:[28]

> "Some of the clerical staff are actually a bit nervous because there is a concern that with the health professionals actually using the computers and entering data and retrieving data, it minimizes their function at this time and they view it like 'What are we going to be doing in two more years if this gets really implemented?'"

In instances when We//net threatens a stakeholder group, this may also be an incentive for the group to become involved in a significant fashion. For example, interviewee D suggested that pressure from information literate patients may be an incentive to less information literate providers to become more literate. Another (interviewee J) suggested that physicians assumed a leadership role in relation to We//net (e.g., forming the Medical Advisory Group to the We//net Initiative) partially to protect themselves from policies that otherwise might have been imposed on them by other groups. A third

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[28] Of all the interviewees who contributed to this study, interviewee A would have had the most exposure, on a daily basis, to front-line health care workers.

interviewee (interviewee K) commented that physicians could either assume this role or pass on the opportunity for leadership and have someone else "do it to them." Interviewees suggested that pharmacists may have been influenced to adopt a leadership role in relation to We//net by an even more pressing need to prove their worth, expand their scope of practice, and protect their profession.

Information Policy Factors

Also mentioned in the interviews were, not surprisingly, a number of information policies that were thought to have influenced the reactions of We//net's stakeholders.

Privacy and confidentiality. At the project's outset, We//net's *Strategic Plan* recognized that "for the full potential of We//net to be realized, the rules associated with privacy and confidentiality [needed] to be fully defined and widely accepted" (IBM, n.d., p. 8). During the period of the interviews (i.e., 2000) We//net was subject to the parameters of the Freedom of Information and Protection of Privacy Act and other relevant legislation, and was very aware of the dual challenge of privacy/confidentiality and effective information exchange. "In order to proceed with projects within that legislative environment, either on a pilot basis or to full provincial rollout, Alberta We//net obtained explicit consent from Albertans for each and every incident of the collection, use and disclosure of personal health information" (Alberta We//net, 2000c, p. 1). Despite this obvious commitment to safeguarding privacy and confidentiality, the factor emerged as a theme in nearly all of the interviews. It also emerged from the analysis of Hansard and We//net documents, and was a frequently reported issue in Alberta newspapers (e.g., Arnold, 1997; Johnsrude, 1999a; 1999b; 2000; Lisac, 1999). Health professions also articulated privacy and confidentiality concerns; for instance, this

issue was raised by two delegates during a presentation by John McAllister of We//net to an AMA Representatives Forum in 1999 (see http://www.amda.ab.ca/general/communications/publications/add/1999/may-june99/wellnet.html). Privacy and confidentiality was perhaps the most predictable barrier to the program's development at the outset.

The issue was first mentioned in the Alberta Legislature by Richard Marz, a Government MLA, in January 1998 when he stated that "the top priority of Alberta We//net is protecting the privacy of personal health information." The relationship between Alberta We//net and health information legislation is more completely discussed in the subsequent discussion of *Boundary Issues*. Concerns about the timing of We//net deliverables and the passage of health information legislation (i.e., Bill 40) were raised on multiple occasions by Gary Dickson and other MLAs. Their main concern was that development of We//net architecture proceeded without health information legislation being in place.

Other privacy and confidentiality themes emerged from the interviews that were specific to We//net. For example, one interviewee commented that certain We//net training sessions included privacy and confidentiality training which "heightened the awareness, but also unduly raised concerns about what would [otherwise] be considered acceptable practice." This may have created barriers in some workplaces, an effect which the interviewee suggested was most likely a temporary one.

Interviewees said that providers, especially physicians, were concerned about the uses that the government might make of even aggregated information. It was suggested that providers feel that they are the patient advocates in terms of We//net and that they

must represent their patients in terms of privacy and confidentiality. Interviewee E commented that "the public and the professions that serve the public aren't interested in something that will take personal health data of an individual and somehow make this inappropriately available to government. So there's always a certain wariness in the professional community in that regard."

Interviewees also mentioned the impact that collecting consent information might have in terms of liability and workload, and, in response to questions about whether there were concerns that We//net would influence clinical policy making, interviewee I responded: "At a very guttural level I think there are some people who [were] responding to that and who [were] worried, but they [expressed] it through issues of privacy and confidentiality, who is going to use their information?" The implication here is that privacy and confidentiality (as with cost issues) was a potent argument that could be used to confound other developments or perhaps be used as a "smokescreen" for other issues.

Secondary uses of information. Secondary uses of information emerged as potential challenges to We//net in only two interviews (H and C). However, what is interesting is that each interviewee identified a different potential challenge. Without leading other interviewees it was not possible to verify that these were actual challenges to the program, but they may be interesting dimensions to consider in future research and other projects. It is also useful to note that both interviewees mentioned this factor in relation to PIN, which was the most developed We//net initiative at the time the interviews were conducted.

One interviewee commented that the nature of the information that PIN requires from We//net puts government in the role of a secondary user. Government would like to

have access to cost information (i.e., via PIN) in order to consider the cost-effectiveness of certain health interventions and practices, not at the individual level but at the aggregate level. However, the interviewee explained that the perception that government wants to examine individual practices or organizations was a challenge to the inclusion of this information.

The second interviewee said that physicians were very concerned about whether information from PIN might be provided to other stakeholders, such as IMS Health Canada, an organization to which pharmacies routinely provide data. If this were to be the case, the interviewee suggested that this would potentially represent a weakening of physician control over their patients' information. Also, the interviewee suggested that physicians were concerned about the use that pharmaceutical companies might then make of information obtained from IMS, particularly in how it might inform their marketing efforts.

Shared information access. As was mentioned in the literature review, shared information access is a prerequisite to case and care management. As an objective of We//net's,[29] it is important to note that shared information access may be as a much a barrier to the development of integrated health ICTs as it is an incentive to those systems' development. Interestingly, information sharing appeared to challenge We//net only

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[29] Halvar Jonson commented in the Legislative Assembly of Alberta in March 2000 that the "province-wide health information network [would] allow health professionals to share necessary information and best practices."

inasmuch as it affected previously mentioned factors such as competitiveness, scope of practice, inter-provider relationships, accountability, and privacy and confidentiality.

At the same time, the promise of shared information access (perhaps in the form of electronic patient records) was clearly an attractive option to We//net stakeholders, in general (e.g., see "Alberta We//net: Physicians integrating care across Alberta", 1998). The critical element is the phrase "in general" because whereas interviewees indicated that the public, government, RHAs, and providers view electronic patient records as a "good thing" (or "not necessarily a bad thing", see Rossall, 1999, p. 23), they also tended to qualify their comments by saying that it was in the details of who gets to see what information that challenges arose.

Chapter Conclusion

The data analysis presented in this chapter suggests that social and political factors influencing stakeholder reactions to Alberta We//net can be loosely divided into four categories: exogenous factors, business factors, professional factors, and information policies. Various factors in each category seem to have played significant roles in the We//net story although it is not possible, on the basis of this analysis, to identify any one factor as being most significant. The analysis indicates that the relationships amongst factors (e.g., regionalization and the funding model that the program adopted) were complex and evolving over the course of the program. However, despite this complexity, the factors discussed in this chapter have in common the fact that they were largely outside of We//net's control. The factors discussed in Chapter Six, termed "process attributes", were much more directly under We//net's control. For instance, while leadership and governance, two of the themes discussed in the next chapter, are often

critical success factors in many projects, the form that these attributes take is very much a conscious decision of the program's sponsors. This is quite different than a factor like stakeholders' past experience, which was discussed in this chapter; this factor can be accounted for by the program but nothing the program can do will change past experience.

Chapter 6: Process Attributes

Process attributes were defined as the attributes of We//net's development and implementation processes that influenced the reactions of the program's stakeholders. A number of these factors were identified that related to political and social interests of stakeholders.

Consensus building. Consensus building emerged as a strong theme in the interviews, very much related to the program's leadership and governance (which are discussed separately below). The importance of each of these other factors is discussed elsewhere, however it is important to note that decisions made in regard to any of these three factors influenced the others. Interviewee I said that "it's all about people. You do need personal relationships established and so much of one's ability to execute depends on the relationship building."

It is impossible to say which of the three factors—leadership, governance, or consensus building—was more important; they are different concepts with a high degree of correlation. However, consensus building was clearly a value that We//net adopted from the outset. Halvar Jonson, then Minister of Health, commented in the Legislative Assembly in February 1998, "We want to do it [i.e., We//net] right. We want to involve many stakeholders that are affected in the process." One government interviewee commented that "communication, getting understanding and buy-in, is the greatest challenge and continues to be." Interviewee E said, "The number one critical success factor for the evolution and success of provincial infostructures, quite frankly, is the collective will to proceed. Nothing is more important, including the money."

The program's need for this approach was perhaps first recognized by Ernst and Young (1996) when they said that "the approach must be fully inclusive of Alberta Health, regions and boards, physicians and other stakeholders required to build and reach the vision" (p. 5). Consensus decision making subsequently happened at many different points throughout We//net's history. For instance, consensus had to be reached on the program's governance, on most, if not all, of the program's initiatives, and within some of the stakeholder groups themselves. Failure to reach a general consensus at any of these points could have stopped We//net and the program was able to avoid this state of affairs. But the approach was not without cost.

Interviewee D commented that the program had two potential ways of implementing projects. The first strategy, and that which We//net employed with its larger projects, was to work in a very collaborative manner with stakeholders. As the interviewee commented, "You've got to work through it, you've got to get everybody's opinion, you've got to work it out, you've got to try and find that common ground where you can build on and then deal with the exceptions." The obvious implication of this approach is that it can be time consuming, particularly with controversial or sensitive projects.

The second strategy that We//net used (e.g., Seniors Drug Profile), forced by the pragmatics of showing value to stakeholders quickly, was to move projects more rapidly to implementation. As interviewee D commented, "Just build and then let the people start to use it." However, this strategy appears to have had the same results as the previously-described consensus building approach. As the interviewee commented in regards to the Seniors Drug Profile, "It should have been easy but it was horribly difficult!" Despite an

obvious need for the application and existing sources of data, it appears that there was a substantial debate around the application that slowed development and implementation considerably.

Interviewees also commented on the implications of the consensus building approach adopted by the program: the difficulty of getting stakeholders to the table, influencing them once the program had them on board, and then moving the program forward quickly. Interviewee D suggested that We//net was "supposed to be looking at the health sector as a whole, prioritizing based on the health sector, when nobody else [had] that mandate. So everybody pretty much [had] that focused interest."

Given this (and other factors, such as the impact of regionalization on the relationship between the RHAs and Minister of Health, and the funding model that was developed for We//net) it seems that a consensus building approach was the only model that We//net could have reasonably employed. Interviewees suggested that this was the case, although there is a sense that the program gradually moved to a more directive approach after its inception. Perhaps not surprisingly, many interviewees commented that while there was substantial consensus on the program in general, it was in the details that there was a diversity of opinion, thus proving the old adage that "the devil is in the details". Interviewee K suggested that consensus is greater the "higher one goes into the stratosphere." Another (interviewee E) commented that "after all of the kafuffle and hype around We//net and the partnership and all this, it's just about getting everybody to play together."

Governance. Governance includes the accountability framework and management processes for a program, and the framework for We//net's governance is outlined in their

Web site as their advisory and accountability structure (see Figure 1). While interviewee E suggested that We//net's governance technically never changed, governance proved to be one of the most frequently raised program attribute in the interviews, as well as in the Hansard transcripts. It is, as has already been mentioned, inextricably related to the consensus building approach that We//net adopted and to the program's leadership.

The question of We//net's governance was raised in the Alberta Legislature on a number of occasions. However, it does not seem to have been a particularly contentious issue, being raised more as an item of information more than anything. For example, Hugh MacDonald, an opposition MLA, asked in February 1998 if We//net was "going to be a program that [was] going to be divided up by the regional health authorities" and also if it was going to be a province-wide program. Subsequent discussion in the legislature focused more on the program's leadership in the person of Dan Bader. As Bader in 1999 moved into the portfolio of Deputy Minister for Strategic Information Technology Initiatives and Chief Information Officer within Public Works (part of his portfolio being We//net), questions in the Legislature sought to determine how this would affect We//net's relationship to Alberta Health and Wellness. In essence, it did not reflect much change since Bader continued to report to the Minister of Health in terms of We//net. The Auditor General of Alberta identified the challenge of ensuring accountability in a multi-stakeholder environment as a risk to the program and also as an issue for the program to address (Valentine, 1998; 1999; 2000).

When asked about governance of the Pharmacy Information Network, interviewee B responded, "Well that's one of the big issues, one of the big questions that keeps coming back to the table and I don't have a simple answer because it hasn't been really

addressed by the [PIN] Task Force and it's a question that also I think is really linked to We//net governance." Later in the same interview the comment was made that "issues like governance have been right up there front and centre and have been frustrating." A second interviewee said, "Interestingly enough, because it was none of any of these particular groups' [i.e., We//net stakeholders] idea, none of them feel that they actually own it." The implication was that while RHAs and providers felt that We//net was the government's idea, government felt that the program was based on the advice of providers.

It is not that We//net did not have a framework for governance, because it had one in place since the beginning of the program. However, what was not clear at the time of the interviews was how We//net initiatives would be sustained and administered in the long term and upon delivery. This appears to have been the governance challenge that interviewees spoke about.

Governance, of course, comes down to ownership, control, and access. Stakeholders want enough control of a program, or enough influence with a program, that their interests are protected. This was raised as an issue by a number of interviewees. The impact of this factor on We//net was to encourage buy-in from those groups who had control (or felt that they had control) and to discourage involvement and support of those groups who did not have control (or felt that they did not have control). As interviewee D commented, "If they can't control them, they don't necessarily want to support them." This seems to have been the biggest issue for the RHAs who ostensibly were co-owners of the program. RHAs appeared to be nervous that they would be "stuck paying for . . . something that they [didn't] have control of."

Interviewees reported that the government was very aware that giving one group (such as RHAs) control of the program would create tension with other groups (e.g., the health professions). Consequently, Alberta Health and Wellness attempted to structure the program such that control was in the hands of the stakeholders yet not concentrated in the hands of any particular group.[30] Two interviewees (E and F) suggested that this was a conscious effort to delay discussion of governance until a more appropriate time. "[We//net] did not want to get arguing about governance before [it] actually had some momentum and [was] doing things. You can have huge debates about governance before you even have anything to govern," interviewee E commented. While this was not an insurmountable barrier for We//net it does appear to have slowed implementation of the program.

The general finding in this case seems to be that while governance seemed confusing or challenging to some stakeholders, We//net understood that leadership was more critical to the progress of the program (i.e., leadership filled the vacuum left by confusion around the formal structures of governance). It was suggested by interviewee I that the program's accountability and governance were purposely kept vague because leadership in Alberta Health and Wellness wanted to see how the program would unfold (i.e., the "heavy hand" of accountability might have otherwise prevented consensus from building, or at least delayed it).

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[30] For instance, interviewees suggested that the RHAs and professions were perfectly balanced on the Senior Reference Committee.

Leadership. Leadership of We//net was provided by different people over the course of the program. Names that emerged repeatedly from the interviews included Tom Noseworthy, Jack Davis, Mary Gibson, John McAllister, Dan Bader, and others (see Chapter 3). Each of these people reportedly played a critical role in developing We//net and compensating for the ambiguity of the program's governance. At a number of points in the program's development interviewees reported that there were several people "leading" the program. This might not be unusual for programs of this size and scope although what is more interesting is how much this appears to have been a somewhat conscious decision.

Interviewee E said, "I think [We//net's leaders] have all done a very, very good job of keeping everybody together, trying to keep them focused, keep everybody moving forward, working from a common set of priorities, keeping IBM and the other IT players moving and disciplined. Yeah, this is a very, very tough thing to manage and when you have a tough thing to manage you need strong leaders who need to manage some of it by force of personality as opposed to, you know, the tightness of the structure."

Interviewees discussed how the program's relationship with Alberta Health and leadership changed over its history from its inception with reporting through the Senior Reference Committee to the Assistant Deputy Minister of Health, to the addition of a CEO and the subsequent changes in that position's accountability within government. Interviewees suggested that the leadership of two individuals, Jack Davis and Tom Noseworthy, was a key factor in the program's early success. Recognizing that Alberta We//net was in an administrative setting where change was constant, charismatic, visionary and authoritative leadership of the program was extremely critical. It is also

important to note that existing in a situation of constant change as it did, the benefit to the program was flexibility in terms of decision making.

Participation. How stakeholders participated in the We//net program appears to have been a critical factor in how they related and responded to the program. Valentine (1998) identified participation, or the capability, readiness, and willingness of stakeholders to participate in We//net, as a significant risk to the program. Participation embodies a number of activities including communication, involvement in decision making, and representation. Clearly it is also related to other process themes including governance, leadership, and consensus building. A number of participatory mechanisms have already been mentioned: RHAs were included in We//net committees including the Senior Reference Committee and the Technical Coordinating Group; physicians were represented at a professional level on various committees but perhaps most significantly through the MAGWI; and other stakeholders (such as nurses) were represented on We//net committees (e.g., Margaret Edwards represented the Alberta Association of Registered Nurses on the Senior Reference Committee, pharmacists were represented on the Senior Reference Committee and to a lesser extent on the Technical Coordinating Group). In addition, We//net had many planning meetings with stakeholders at the local level for specific projects and also included stakeholders in its Project Task Forces.

Comment has also already been made of interviewees' perception that the RHAs had differing levels of involvement; the larger RHAs (i.e., Calgary Health Region, Capital Health, and David Thompson Health Region) having greater representation than the smaller RHAs which were represented as a block by one individual. This may have influenced regional receptivity to We//net. Interviewee A suggested that the program was

"viewed by many of the smaller health authorities as . . . an external agency that [imposed] its direction upon the smaller health authorities." The opinion was also expressed that when input was given to We//net, it was not always included in decision making and outputs. The perception is that this generated a level of suspicion of We//net's leadership (although it was stated for the record that this level of suspicion did not affect relationships with other We//net staff). However, it may have been that IT staff in the RHAs were more suspicious than other staff. Interviewee A said, "I would suggest that many of the smaller [Regions], the rural ones, had serious problems on the IT side and almost no problems on the health service professionals' side." Clearly We//net put a lot of effort into engaging health professionals in the RHAs, but perhaps less effort into engaging the support of local IT staff.

In terms of PIN, physicians, pharmacists, and government all had extensive input into the development of the initiative. Interviewees reported that the RHAs, while also involved, participated less significantly in the initiative's early implementation. Government also took a slight back seat to physicians and pharmacists in recognition of their role as a secondary user of the information; consequently, the needs of pharmacists and physicians were heavily emphasized in the early implementation stages of PIN.

In terms of the professions, participation in We//net planning was primarily via professional organizations like the Alberta Medical Association, the College of Physicians and Surgeons, the College of Family Physicians (Alberta Chapter), and the Alberta Association of Registered Nurses. As interviewee D commented, "[We//net] hasn't done much in terms of dealing extensively with the day to day practicing physician, pharmacist, or nurse, or whatever . . . but until [the program is] actually out

installing product and changing the way they do business it's no sense getting everyone too worked up."

A We//net interviewee commented that "the Associations and the Colleges [were] the ones that [represented] their users most extensively. And that's where we've had most of the representation. And then on individual working groups we've had actual practitioners giving us direct advice on kind of unique processes." The program also used focus groups to solicit input from "front line" practitioners but for the most part We//net dealt with the professional associations and the organizations (such as RHAs, Council of CIOs, Council of CEOs). Other interviewees commented that the professional memberships at large were generally not aware of We//net as there had been little reason for them to get involved and that this was the case with most of the professions (except for pharmacists who were much more involved in PIN). Interviewee G said, "There was very little concrete anything that you [could] take to nurses and physicians or anybody else for that matter and say, 'This is what We//net is doing.' Because most of what We//net [was] doing [was] sitting around thinking."

Several interviewees commented that physicians did not feel particularly involved or included in We//net at the program's outset. Individuals had been appointed to various committees but there was not general representation of the profession as a whole. The Medical Advisory Group to the We//net Initiative (MAGWI) was instigated by We//net as a response to this situation. "I think there was a very strong feeling that physicians needed to take ownership of this process, that it had to be representative, the various physician interests had to be at the table, and that's why there needed to be a medical advisory group," said interviewee J.

The situation with other professions was a little different. While physicians were involved quite significantly in almost every We//net initiative, it is interesting to note that none of the other professions challenged this position of influence and power.

Nursing was represented, as has already been mentioned, on the Senior Reference Committee and the Technical Coordinating Group. However, broader representation like the physicians was not thought necessary in the earlier implementation and development stages of We//net. Interviewees suggested that nursing's role will be greater once the program develops.

Private sector involvement. The varied involvement of private sector organizations in We//net's planning, implementation, and evaluation was a recurring theme throughout the program's history. Gary Dickson, an opposition MLA, on March 9, 1998 in the Alberta Legislature, discussed his party's concern about the several hundred million dollars that were being paid to IBM ("or the other members of that consortium") who would retain copyright of the developed systems. However, this was the only occasion on which this particular issue was raised publicly at a government level. Subsequent questions in the Legislature about private sector involvement usually focused on the role of private sector organizations in relation to health information and privacy.

However, four interviewees raised the issue of private sector involvement in We//net. Interviewee I commented that while We//net initially outsourced its strategy to IBM, it found that this approach was untenable and had to take strategy development "back inside." The same interviewee also suggested that in general the private sector does not understand government particularly well. Because We//net represented government business as well as health business, consultants working on the strategy needed to

understand the government's business as well as they understood the health business and the technological aspects of the program. Interviewee I commented that this was not the case and was an early challenge to the program. Another interviewee said that We//net's experience suggests that strategy and architecture development cannot be outsourced.

Timing of benefits and deliverables. Timing is a risk for many projects and in fact projects in many areas do not deliver outcomes according to their initial schedule (Worthley, 2000). However, timing was doubly a risk for We//net in that the program was trying to develop infrastructure at the same time as it was implementing early initiatives such as Common Opportunities and the Seniors Drug Profile. The Ernst & Young report (1996) suggested that the program "design for overall integration, but implement incrementally" (p. 13).

The report went on to recommend that the program acknowledge the following considerations:

1. "Home run" proposals[31] have been intimidating.
2. Define projects which are doable in the short term and bring results in the "first wave."
3. Accept imperfection, but improve through iterations (p. 13).

We//net's ability to deliver initiatives and benefits to stakeholders clearly influenced a number of stakeholders' reactions to the program. Noseworthy (1998; 1999) identified the realization of benefits to Regions and individual Albertans, and We//net's ability to manage the stream of costs and benefits as key challenges to the program. The program itself reported that "one of the main challenges for Alberta We//net has been balancing

[31] That is, proposals that attempt to address an issue comprehensively rather than incrementally.

short-term, tactical projects that would provide immediate benefits to the health system with the careful planning required to effectively develop a comprehensive, integrated health information network" (Alberta We//net, 2000a, p. 1).

It took time to develop We//net partially because of the consensus and governance frameworks that were chosen, and the large number of stakeholders that were involved. Also, We//net's ability to deliver initiatives was limited by the program's complexity, the need to develop infrastructure, the innovative nature of the program and its initiatives, and its annual capitalization. However, interviewees reported that the government clearly wanted to see some deliverables from the investment in We//net. Halvar Jonson commented in the Alberta Legislature in 1999 that

> "with the designing of We//net there were two schools of thought, and that is that you should get everything in place conceptually and that you should get the whole framework in place before you take on any specific deliverable projects, such as a pharmaceutical information system. However, you can only take the philosophical approach with the taxpayer and the public for so long. I recognized that a year or a year and a half ago. So I have asked as minister for certain specific deliverables in terms of programs or initiatives that we can actually get in place so that people can see what We//net can do for you, while we still have to keep looking at the overall planning of the whole package. That is what we're doing in this year's business plan, and we could provide information on just the specific things we want to get done so people can see it actually working in the coming year."

In a number of committees of supply of the Alberta Legislature, Opposition party members through 1999 and 2000 pressured the government for information or evidence that We//net was delivering benefits to the health system and Albertans. Government was eager to show some return on the We//net investment and may have in turn communicated that pressure to We//net. "So what that really did was forced us down the road choosing more tactical initiatives than we might otherwise because the investment really needed to be both an infrastructure and a strategic project, long term payoffs,"

commented interviewee D. Another interviewee said, "The scope and magnitude of it just frustrates people. It doesn't move quicker, but it's not that people aren't trying to move it as quickly as they can."

Many interviewees spoke of the longer term benefits of We//net. That is, even after initiatives were implemented benefits did not immediately accrue (i.e., in some instances increased workload, paper work and short deadlines were reportedly the short term results). Also, interviewees suggested that We//net's need to deliver services and initiatives may have imposed shorter deadlines on projects than might have otherwise been desirable, taxing the resources of some of their stakeholders.

While the RHAs were partners with Alberta Health and Wellness as investors in We//net, clearly they wanted to see some return on their investment, as did the government. One challenge that interviewees mentioned was that RHAs (and other stakeholders) looked for personal and local/organizational benefits, whereas We//net's focus was on the provincial health system and provincial benefits. Interviewee K suggested that with provincial health information systems the financial benefits often fall elsewhere in the system rather than with the RHAs that actually pay for the system. For instance, in the case of Telehealth, benefits accrue to patients outside of the region and the physicians who do not have to travel or who can work in a more urban centre. These benefits are not immediately apparent to the urban RHAs that pay more for the system than the rural RHAs. Recognition of this was part of the reason that Alberta Health and Wellness funded the RHAs' participation in We//net as it did.

It is also interesting to note that the simple act of naming the program (i.e., Alberta We//net) raised stakeholder expectations around benefits and deliverables.

Interviewee E commented that at the program's outset "people were prepared to sit back for a year or two and not expect too much, but once the name went on and a couple of years went by people wanted to start to see results." A number of government and We//net interviewees commented that a general learning from their involvement in We//net was to not expect projects of this scale to deliver benefits and deliverables quickly.

Chapter Conclusion

The analysis presented in this chapter suggests that the way in which We//net conducted its business and structured itself was an important factor in stakeholder responses to the program. While it is not possible, on the basis of this data, to comment on the relative importance of the various factors, clearly interviewees felt that factors such as the program's leadership and governance were important elements of the We//net story. These factors, unlike those discussed in the previous chapter, were those over which the program had the most influence, if not control. As with the contextual factors, however, process attributes were clearly closely related and difficult to discuss separately in the analysis. The following concluding chapter attempts to draw some more general conclusions from this data analysis.

Chapter 7: Conclusion

In general, it is clear that a number of socio-political factors and policies did influence the reactions of We//net stakeholders to the program. This is not surprising given that the IT literature acknowledges the importance of numerous social and political variables in information system implementation (e.g., Anderson, Aydin & Jay, 1994). The literature of other fields (e.g., policy implementation, change management) demonstrates more generally that non-technological factors significantly influence the processes and outcomes of many programs and policies (e.g., Barlow, 2000; Coleman, 1997; Kling, 2000; Levine, 2001; Rocheleau, 2000; Schacter, 2001).

One general observation that might be made about the development and implementation of the We//net infostructure is its similarity to other large public programs. For example, the consensus decision-making approach adopted by We//net (and discussed in more detail below) was a common attribute of much late 20th century public policy implementation. Howlett (2000) has observed that modern governments "have increasingly come to rely on the use of a . . . set of 'procedural' tools designed to indirectly affect outcomes through the manipulation of policy processes" (p. 413). As another example, privacy and confidentiality are general public concerns that influence many programs, both private and public. The Auditor General of Alberta acknowledged these commonalities when he said, "We//net is not just about technology. It is a business change initiative of considerable scope and importance to the health system of Alberta" (Valentine, 1999, p. 209). A number of general conclusions that might be drawn from this study are discussed below.

Autonomy, Accountability, and Scope of Practice

The real and perceived influences that information systems have on the accountability of the health professions, and their role in performance measurement and improvement, is a significant theme in the literature (Aydin & Rice, 1991; Armstrong & Armstrong, 1999; Alberta Medical Association, 2000; Bates, et al., 1999). Physicians in particular, with the profession's historically high degree of autonomy and self-regulation, may perceive IT as a means of scrutinizing their practices. Surprisingly, interviewees reported that We//net's goal of improving accountability within the health care system was not a barrier to the implementation of the program, despite the fact that We//net has made this goal very explicit. One possible explanation for this is that stakeholders supported We//net's goal of providing information that would allow the examination of broader patterns of health system utilization. Had We//net's goal been the collection of data to support the examination of individual practice pattern, the response to the program would probably have been quite different.

Similarly, the program's influence on stakeholder scope of practice did not appear to challenge We//net in any significant manner, although the literature would suggest that it is frequently a barrier to health IT implementation (Alberta Medical Association, 2000; Alpay, Needham & Murray, 2000; Committee on Enhancing the Internet for Health Applications, et al., 2000). However, five interviewees did indicate that providers and RHAs were generally concerned about the influence that We//net might have on their autonomy, suggesting that while stakeholders appear to have been uncertain <u>how</u> We//net would affect their autonomy, the perception that it <u>might</u> do so caused some concern.

Several interviewees suggested that accountability, autonomy, and scope of practice were not more significant issues because of a couple of factors: (a) at the time this study was conducted, We//net projects had not progressed beyond the pilot stage (i.e., the professions in general were not aware of, or involved in, We//net initiatives); and (b) other issues, such as health information and health facilities legislation were more publicly and politically significant (i.e., higher priority) and consequently issues of autonomy and accountability were "submerged".

Blurred Boundaries

One group of issues emerging from the data were categorized as "boundary issues". The nature of these issues was such that some stakeholders saw them as We//net-related issues; others regarded them as separate issues entirely. This suggests that the reactions of some stakeholders to developing provincial health infostructures will be coloured by their reactions to other closely related policies and policy instruments (i.e., health information legislation, discussed below).

One question that might have been explored with interviewees was where We//net ended and other policy instruments began. Stake (1994) has suggested that "boundedness and the behavior patterns of the system are key factors in understanding the case" (p. 237). He has also suggested that "the more the object of study is a specific, unique, bounded system, the greater the usefulness of the . . . [case study] rationale" (p. 237). While the We//net case had boundaries, it became apparent that these were more permeable or blurred than they appeared at the outset of this study.

In We//net's case, this boundary permeability occurred in relation to health information legislation. One interviewee suggested that from a provider perspective the

regulations and restrictions of the Health Information Act appeared indistinguishable from the impact of a particular We//net application on the workplace. That is, although the Health Information Act and We//net were separate government initiatives, some stakeholders saw them as the same initiative. Interviewee A commented that "there are tighter rules or tighter directives, particularly in the area of confidentiality and privacy that aren't directly associated with implementation of the We//net packages but that are really forced with We//net." Interviewee J commented that "We//net [was] perceived to be involved in issues of privacy and confidentiality even though [they weren't]. We//net [protested] to the physicians that they [were] the messenger, they [weren't] the source. But physicians perceive whoever's being in information systems to be the source of a problem." One opposition MLA even went as far as to suggest that We//net should have been called "Orwe//net" (http://www.times10.org/olsen_march_2000.htm).

Government and We//net interviewees tended to see a clear difference between We//net and the Health Information Act. These groups of interviewees indicated that the We//net program represented infrastructure whereas the legislation represented the more controversial rules that would govern its use. Of course, the two components, infrastructure and policy, complete the health infostructure and are interdependent, linked by the same policy problem (i.e., integrated, system-wide health information, to improve the health of Albertans and the management of the health system). The lesson here is possibly that not all stakeholders will have a perspective that allows them to discriminate between such interdependent policy instruments.

From the perspective of those who did not distinguish between We//net and health information legislation, patient privacy and confidentiality are clearly substantial barriers

to be overcome. A number of researchers and policy analysts have commented on the complexities of this issue and it was certainly expected to be an issue with We//net (Denley & Smith, 1999; Lasker, Humphreys & Braithwaite, 1995). We//net also recognized the importance of this potential barrier and made numerous references to it in its presentations and documentation (see http://www.albertawellnet.org/faq7.html).

Communication

Anderson and Aydin (1997), Worthley (2000), and Rocheleau (2000) have suggested that effective communication is a critical success factor for IT implementation, particularly for managing change associated with the implementation. However, they acknowledge that research is needed to determine how communication affects acceptability and outcomes, if at all.

In the case of We//net, the Program's consensus decision-making model, advisory committee structure, and networking with other organizations and committees (e.g., MAGWI, Council of Chairs, Council of CIOs) indicated its recognition of the importance of this factor. Interviewees spoke to the importance of communication but conclusions cannot be drawn as to how communication influenced stakeholders' reactions to the program. Clearly this is an area for future exploration.

Competition

Of the business factors that emerged as factors in the case of We//net, competition, or the rivalry between multiple businesses for a particular market, was not one that was identified in the literature review. It may be that this is a sensitive topic that is overlooked, intentionally or otherwise, in other studies or it may be that this is not usually a significant factor in Canadian health information systems implementations. In

We//net's case, it was a very minor theme, raised by two interviewees as a potential challenge to We//net rather than as an actual challenge. The relationship of this factor to the reactions of We//net's stakeholders cannot be gauged and further study of the factor is indicated.

Cost containment

The expense of health information systems, particularly those on the scale of We//net, can be a challenge (Mousin, Remmlinger & Weil, 1999; Valentine, 1998). The program's stakeholders appear not to have questioned the total expense of the program, but were more concerned that the costs be contained and linked to a clear accountability framework. Also, several interviewees spoke of the perceptual difficulty of the investment in We//net. The program's funders clearly felt some concern during the program's developmental stages that deliverables were not more visible. The general concern, therefore, appears to have been related to delivery of expected outputs and outcomes within a specified budget and timeframe rather than the overall cost of the program.

Cost to individual stakeholders, particularly physicians, was also a significant challenge to the program. This finding is congruent with other findings in the literature (Committee on Enhancing the Internet for Health Applications, et al., 2000; Noseworthy, et al., n.d.) and was not unexpected. We//net responded to this challenge, in the case of the Physician Office System Program (POSP), by adopting an application service provider model. This model recognized that acquisition costs can deter users from participating in IT initiatives and consequently offset some of these initial costs, with ongoing maintenance costs paid by user subscriptions. In the case of POSP, a joint

agreement between the Alberta Medical Association and Alberta Health and Wellness provided a pool of funds for cost-sharing with physicians (Steed, 2001). The success of this strategy remains to be seen, although clearly it is an approach that satisfied two of We//net's major stakeholders (i.e., Alberta Medical Association and the Ministry of Health).

Decision-making

We//net's collaborative or consensus decision-making approach emerged as a theme in many documents and interviews. One interviewee suggested that the "collective will to proceed", the desired outcome of consensus decision-making, is perhaps the most critical success factor for the development of provincial health infostructures. Consensus-building was the most obvious policy adopted by the program to foster stakeholder participation and it was an approach that had implications for many aspects of the program's development and implementation. For example, RHA financial contributions to the program were voluntary, a policy that was expected to foster active RHA participation in, and ownership of, the program.

There were at least two factors that predisposed the program (and Alberta Health and Wellness, the program's sponsor) to adopt a consensus decision-making approach. First, at the program's outset the health system was still equilibrating following the profound organizational change of regionalization. The Ernst & Young report (1996) identified "lack of stakeholder consensus/commitment" around this time as a significant barrier to implementation of a provincial infostructure. Regionalization also reportedly weakened the Ministry of Health's ability to take a more directive approach with the RHAs (see Ernst & Young, 1996, section 5, p. 34). Given this organizational disturbance

and the relationship between the RHAs and the Ministry, it would appear that a consensus decision-making approach was the logical choice for implementation. This choice echoes Sinclair and Hooper's (1998b) suggestion that provincial health information systems require the "full support and enthusiastic participation of the full spectrum of 'players' in the field." Anderson (1999) has also suggested that broad stakeholder involvement in the selection and implementation of new information systems from the outset is essential, or else support will not be forthcoming. It is unlikely that such support from stakeholders would have been forthcoming had the Ministry simply imposed We//net initiatives on them as a *fait accompli*.

Second, a collaborative approach is an increasingly common attribute of public policy development and implementation, and We//net's adoption of the strategy was in accordance with general government trends. Pal (1997) and Cline (2000) have commented on the government shift in the 1990s to consensus decision-making, partnerships, and networks. Barlow (2000) has stated that "the traditional, top-down model of leadership . . . is being replaced by a more negotiated view that sees leadership operating within an interpretive context that it can influence but not control" (p. 19). This approach, it is argued, is commonly taken by governments in situations where there are "contexts of dispersed power, [and] layers of mandates" (Cline, 2000). Plsek and Wilson have argued that whole system targets, which by their very nature require some form of

consensus or unity of support, may be useful in complex adaptive systems[32] such as We//net (2001).

Howlett (2000) might characterize We//net as involving a number of procedural policy instruments, as opposed to substantive policy instruments (i.e., "those instruments intended to directly affect the nature, types, quantities and distribution of the goods and services provided in society" (p. 415)). He has also suggested that procedural instruments may be very appropriate in situations where a government has lost some legitimacy as has been suggested was the case with Alberta Health following regionalization. He argues that "when a serious loss of legitimacy or trust occurs, the subject of political conflict often shifts from the actual substantive content of government actions towards a critique of the processes by which those actions are determined. This can occur at either the macro, or system-wide level or at the meso, or sectoral, level, but, in either case, in order to construct or regain legitimacy, governments resort to the use of procedural instruments to alter network configurations" (p. 423). Had a consensus decision-making approach not already been a feature of Alberta's government policy prior to We//net, on the basis of this argument it seems likely that it would still have been an appropriate instrument.

However, consensus decision-making was already a feature of provincial government policy and continued to be throughout the 1990s. The Fraser Institute has

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[32] "Complexity based organisational thinking suggests that goals and resources are established with a view towards the whole system, rather than artificially allocating them to parts of the system" (Plsek & Wilson, 2001, p. 746).

suggested that the Klein government developed a "consensus of intensities" on the need to eliminate the province's deficit and a "consensus of views" on the means of doing so, to garner support for government budget cuts (http://www.fraserinstitute.ca/publications/pps/46/s9_lessons.html). Other examples include the government's consultative Health Summit in 1999 that sought public input into key health policy questions (http://www.healthsummit.gov.ab.ca/) and Alberta Agriculture, Food, and Rural Development's Web site, which includes material to educate its stakeholders about consensus decision-making (http://www.agric.gov.ab.ca/c2c/index.html).

Consequently, it appears that the approach adopted by We//net was attractive for a variety of reasons: 1) its contextual suitability in terms of regionalization and the complexity of the health care system, and 2) because of its congruence with other government policy implementation. For the most part, the strategy seems to have been successful. For example, balance was achieved between the interests of the two largest RHAs, and other stakeholders appear to have been engaged in We//net to the extent that they wanted to be. However, the voluntary aspect of the funding model, appears to have been less successful at fostering regional buy-in. Some RHAs were reportedly unsure to what extent their funding of We//net gave them a voice in the program's development, while others chose not to contribute funds. Other interviewees reported that there was general confusion about the intended goals of the funding model. It is unclear to what extent the funding model remains a risk for Alberta We//net but other approaches may have been more appropriate.

For example, funding the program completely from Ministry of Health funds would have ensured stable funding for the program, but would have done nothing to

foster stakeholder support for the program (other strategies could have been employed in this regard, however). Nor would this alternate approach have addressed the longer term question of how to sustain the program. However, given that We//net's focus is provincial in scope, it could be argued that the Ministry would be the most appropriate funder for the program in the longer term as well.

The complexity of the environment within which We//net was deployed suggests again that a consensus decision-making model was an appropriate choice. Many of the factors that emerged as challenges to some groups of We//net stakeholders also appeared to be incentives for other groups of stakeholders. In fact, some aspects of the We//net program appeared as both challenges and incentives to the same stakeholder group! An example of the first case occurred with information sharing. While the prospect of access to more patient-related information might be an incentive for Alberta pharmacists to adopt We//net applications, the same prospect is a challenge to physicians and pharmacy owners whose positions in the health system are potentially threatened by such information sharing.

Pharmacists also serve as an example of the second case. While We//net may allow pharmacists greater options in terms of tracking and billing for cognitive services (i.e., potentially expanding scope of practice) the system also has the potential to provide physicians with more value-added decision making tools that may reduce their reliance (and possibly their patients' reliance) on pharmacists. The lesson here is that system implementers need to consider the views of all stakeholders in respect to a particular application. In that sense, We//net's consensus building approach appears to have been a most appropriate implementation strategy.

As an example of collaborative organizational structures, the development of MAGWI and its relationship to We//net is one of the program's more interesting stories. While interviewees suggested that MAGWI had the potential to become a vehicle for physicians to express ill will (and reportedly some of the group's early meetings were difficult), We//net and MAGWI persevered to the point where MAGWI became a *de facto* We//net committee representing the interests of physicians. That the program was able to develop such a mechanism for physician input and leadership speaks to We//net's flexibility and creativity. The end result was a very positive relationship that allowed physicians to participate in the program and also met a number of We//net's needs for information dissemination and feedback.

Future studies might explore if the use of the consensus decision-making approach accentuates the influence of sociopolitical factors on the development of infostructures. Cline (2000) suggests that when policy is implemented in situations where power is disbursed (as it is amongst the professions, regions, and the Ministry) this "makes the strategic contexts in which actors participate an important element of the implementation process" (p. 552).[33] One can speculate that developing provincial infostructures might emphasize the collaborative approach which requires careful consideration of sociopolitical factors, and that more mature programs or programs in more stable environments might favour the traditional administrative model emphasizing control, technical performance, and goal achievement.

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[33] As compared with the more traditional and deterministic organizational management model which views implementation as administrative process emphasizing goal specification and control.

Expectation Management

In a discussion of factors influencing the adoption of object technology, Allard (1998) suggested that the single most important factor is expectation management. He commented that "the highest likelihood of success comes when IS undersells and over-delivers on its promises", a sentiment that has been echoed by Worthley (2000), who commented that many organizations "run the risk of basing their investment on underestimated costs and overestimated payoffs" (p. 11). Anderson and Aydin (1997) have suggested that "individuals should have realistic expectations about what benefits to expect from the system" (p. 390).

Managing expectations was a recurring theme in the We//net case, particularly in relation to the timing of benefits and deliverables. A number of government and We//net interviewees commented that a key learning from their involvement in We//net was to not expect projects of this scale to happen quickly, or to deliver benefits and deliverables quickly. This suggests that even We//net's leadership had expectations of the program, in terms of timing, that may not have been met, at least according to initial expectations. Noseworthy (1998) predicted that the propensity of stakeholders to underestimate the program's costs and overestimate the benefits would be a significant risk to the program. This is a potential perceptual barrier for a wide range of large scale infostructure projects.

Themes from this study that intuitively relate to stakeholder expectations include participation, leadership, and the program's accountability. Stakeholder past experience is also arguably a factor. Unfortunately, it is difficult, on the basis of the data collected for this study, to determine what influence any of these factors had on stakeholder expectations, but several interesting areas for research are suggested.

For example, one might speculate that the development of MAGWI changed physician expectations of the program. Also, expectation management relates to accountability in that an accountability framework (that includes outputs and outcomes) represents an expectation of a program's deliverables which can be developed in collaboration with stakeholders and subsequently communicated to stakeholders. Accountability frameworks are frequently used in annual reporting and performance measurement (http://www.tbs-sct.gc.ca/eval/pubs/RMAF_GUIDE_e.pdf). We//net's accountability was raised as an issue in multiple reports of the Auditor General of Alberta (Valentine, 1998; 1999; 2000), from which one might surmise that stakeholders, at least in the early phases of We//net's development, had a less than complete understanding of the program's expected outputs and outcomes. How this influenced stakeholder expectations of the program is again another possible area of research. The relationship between different leadership styles and stakeholder expectations presents itself as a third topic for research.

Leadership

Leadership is generally recognized as being critical to the development and implementation of health infostructure, and also to change initiatives in general (Anderson & Aydin, 1997; Committee on Enhancing the Internet for Health Applications, et al., 2000). Leadership was central to much of the early story of We//net. The need for leadership was a critical message of the Ernst & Young report (1996) which was the foundation for the We//net program. For example, the report commented that the system had no champions for health infostructure (at the time), and later suggested that

the first change issue to be managed (in developing health infostructure) would be consolidating change leadership (section 5, p. 40).

Leadership emerged as a theme in interviews and documents in relation to several other themes: organizational inertia, consensus building, and governance. The second of these issues has already been discussed but the other two benefit from discussion in the context of leadership and are considered here.

"Hesitancy to change may result from legitimate organizational concerns as well as organizational inertia" (Committee on Enhancing the Internet for Health Applications, et al., 2000) or what Allard (1998) calls "cultural readiness". Other studies (Alpay, Needham & Murray, 2000; Barlow, 2000) indicate that a number of infostructure stakeholders have ambiguous attitudes towards the adoption of new IT. This situation was known to the Minister of Health and consequently the need for leadership to overcome the inertia was identified (Ernst & Young, 1996). At the time, Alberta Health probably could not have lead the infostructure development itself (i.e., the Ministry's leadership would not have been acceptable to stakeholders). Consequently, We//net as an office to provide leadership of the project would have been an attractive option.

Interviewees reported that the leadership provided by We//net (including individuals from the advisory committees) was instrumental in changing the health system's perspective on health information management (i.e., cultural change) and provided a locus for debate on this topic (i.e., to some extent the program removed the onus on individuals within stakeholder groups to "take the heat"). The program was, reportedly, also able to lead and broker initiatives that were outside the mandate of other

stakeholder groups. For instance, had We//net not led development of PIN, it is difficult to see what other group might have done so.

In terms of governance, while it is closely related to leadership, the two concepts are not the same. Governance has been defined as "the institutions, processes and traditions related to issues of public concern which determine how power is exercised, how decisions are taken, and how citizens have their say" (http://www.nt.gov.au/ipaa/conference/Papers/12_3KathleenLauder.pdf). Leadership is a much more amorphous concept that considers such things as a person or organization's influence on others and their adoption of new ideas and practices (http://dictionary.oed.com). Governance is a formal program structure whereas leadership may be considered as an attribute of the people and organizations involved in a program.

In the case of We//net, it is clear that some stakeholders were uncertain as to the form that the program would ultimately take. Governance for the longer term had not been decided, although in the short term the program had a defined accountability framework (http://www.albertawellnet.org/slideshows/update032001/sld009.htm). Changes in leadership at the program and Ministry levels resulted in some concern over the stability of the program in the longer term. Ultimately, however, it appears that the question of We//net's governance in the longer term was left undecided and it is entirely possible that each of the program's initiatives will be sustained in a different form. That said, We//net and the program's sponsors in the Ministry of Health recognized that there were advantages to this ambiguity and that the question of governance in the longer term could be a substantial challenge to the program, if debated before the program achieved any momentum. Consequently, debate on this issue was deferred until a more appropriate

time and the vacuum left by this structure was filled by strong, authoritative leadership from the program and the Ministry of Health.

Interviewees also suggested that strategy development, and to a certain extent, some aspects of transition to implementation do not need more definitive governance. But once program delivery starts, program ownership and control become central, and governance issues become critical. As was the case with the naming of We//net, there is a point in a program's life cycle where questions naturally arise about ownership, control, and funding. It would be interesting, in the case of We//net, to explore more specifically where these points occurred at a program and project level. One might speculate that there is not a single point where these questions arise for the whole program but that they are in fact different for each of the program's initiatives.

The key message here is that charismatic and evangelical (as one interviewee described We//net leaders) leadership was a critical factor in developing buy-in to the program, compensating for the uncertainty that some stakeholders felt about We//net governance, and facilitating necessary organizational change. Given the strength of this theme in the literature it is likely a critical ingredient in other infostructure initiatives and possibly other large scale public policy initiatives (e.g., health reform).

Private Sector Involvement

While there appear to have been challenges with private sector involvement in We//net, general stakeholder concerns over fairness, probity, and expense are recognized issues with public and private sector partnering (Domberger, Farago & Fernandez, 1997). Outsourcing is a commonly used IT strategy and partnering is thought to allow greater flexibility to accommodate uncertainty and change, which would have been a major

advantage in the case of We//net (Domberger et al., 1997; Ernst & Young, 1996; Yesulatitis, 1997). Outsourcing is also a common attribute of contemporary governance (Howlett, 2000). However, interviewees suggested that We//net went too far in outsourcing its strategy, and this is perhaps a significant lesson. Yesulatitis has suggested that outsourcing is "most valuable when the function is not strategic to the business nor a competency that should be developed internally" (p. 81).

Interviewees in this study commented on the difficulty that private sector partners have understanding government. Again, Yesulatitis (1997) suggests that partnerships using consultants in a strategic role can be problematic because they require consultants to be very familiar with the goals and the culture of the organization. This should perhaps be a factor that public IT administrators consider when searching for private sector partners.

Visibility

While We//net as a whole constitutes a provincial health infostructure (if one includes health information legislation), during its early implementation each stakeholder group and perhaps each individual stakeholder seems to have viewed it somewhat differently. The situation is somewhat reminiscent of John G. Saxe's parable of the blind men and the elephant wherein each observer sees the elephant as something quite different (e.g., spear, wall, snake, tree). In the We//net case, the program had many initiatives and appears to have been identified at a local level with the initiatives rather than the whole program. This has implications for how provincial health information system programs represent and market themselves, and communicate with stakeholders.

Workforce Barriers

Human resource burden is a very generally applicable theme or barrier to the implementation of health infostructure. The literature (e.g., Anderson, 1999; Anderson & Aydin, 1997; Ernst & Young, 1996; Shortliffe, 1999; Worthley, 2000) identifies a number of workforce related issues, including

(a) technical staffing,

(b) staff training and development,

(c) changed roles, and

(d) changes in inter- and intra-professional relationships.

This study also identified pre-existing organizational problems as a challenge to We//net, and the past experience of individuals and organizations.

The study suggested that technical staffing and training were issues in some settings for We//net; however, given the small number of interviewees who responded in this regard, it is identified more as an area for future research. Changed roles were discussed earlier in *Accountability, Autonomy, and Scope of Practice*. Interviewees suggested that We//net was not sufficiently advanced with most initiatives, except perhaps for PIN, to influence provider relationships. In the case of PIN, while the potential for changed provider relationships was clearly an issue, it had not been resolved. Changes in patient-provider relationships were reportedly not an issue for We//net and were not anticipated to be an issue for the foreseeable future. At the time of this study, We//net had no specific plans to engage patients as infostructure users.

On the basis of these findings, one might conclude that workforce factors, except perhaps in the case of IT staffing, may not be issues in provincial infostructure

implementation until after the pilot implementation stage, although they should definitely be addressed in early development stages (when strategy and project priorities are being determined). It will be interesting to see if workforce factors become more significant issues for We//net as the program progresses.

Project Management and Organizational Change

One theme that did not emerge from the interviews but was suggested by the documents and literature reviewed for this study, was the importance of sound project management principles and practices as determinants of infostructure success. While a number of researchers (e.g., Lucas, 1981; Rocheleau, 2000; Worthley, 2000) have demonstrated the importance of strong project management (indeed, it is the foundation of project development and implementation in many sectors, not just health IT), it is possible that the questionnaire did not elicit this theme or that it was "below the radar" of the individuals interviewed. Another possibility is that interviewees considered it to be a given and therefore did not raise it as a particularly influential sociopolitical factor in We//net's success.

Another factor that was anticipated but not identified in interviews were the barriers to the implementation of We//net presented by organizational change (Anderson, 1999). There are a number of possible reasons that this factor did not emerge from the We//net case:

1. It is possible that We//net's implementation was not sufficiently advanced that organizational change had not occurred on a scale that would make it recognizable as such. Interviewee feedback on other related themes (e.g., scope of practice) suggest that this may have been the case.

2. It is possible that in interviewing "elite" individuals, the more individual impact of organizational change was not apparent to them and consequently did not emerge in interviews. Individuals with more operational concerns might have identified this factor.
3. It is possible that We//net's early initiatives (e.g., PIN) introduce a minimum of organizational change and consequently they are not challenged on that basis. The strategy might have been for the program to gain some early successes (i.e., "quick wins") and only later to introduce more challenging and change-catalyzing initiatives.

Further Research

A number of avenues for future research have already been identified in this conclusion and several other possibilities also present themselves. Some of these potential research questions were raised by interviewees themselves, others emerged as questions about patterns or gaps in the data that was collected for this study. The most obvious avenue for further research would be to conduct similar case studies in other settings (i.e., conduct comparative case studies). Questions that might be asked include:

1. To what extent do the factors identified in this study apply in other settings?
2. Are there other social and political factors that influence the implementation of health infostructure projects that were not identified in this study?
3. Can measures of strength be developed for influencing factors (i.e., are there tools or can tools be developed that measure the relative contribution

of each of these factors to particular projects)? This question might have application in that it would allow project leaders to prioritize the challenges that they face.

An obvious complement to the present study would be a study quantifying the influence of various factors on the reactions of We//net's stakeholders. A survey tool could be developed on the basis of this study's literature review and findings to encompass the complete spectrum of anticipated influences. The survey could be widely distributed to representative samples of each stakeholder group (i.e., stratified sampling) and possibly supplemented with additional qualitative work (such as focus groups with a greater number of "elite" stakeholders and other groups).

One interviewee, in a discussion of leadership and its importance to We//net, suggested that gender differences played a role in We//net's leadership and administration. The interviewee said, "I can't get into gender-based differences here [but] it is very interesting. That could be a whole thesis." Gender was not an issue that was explored in any fashion, systematic or otherwise, by this study. However, this would undoubtedly present an interesting focus for future research into the leadership of health infostructures or information systems in general. While fewer women appear to have filled key We//net leadership positions, a number have done so.

Another interviewee suggested that a more detailed examination of the Medical Advisory Group to the We//net Initiative (MAGWI) would be worthwhile. The group's formation was in itself quite interesting and its subsequent impact on the We//net initiative has been substantial. As an example of the way in which professional groups

organize and influence other organizations (and are also themselves influenced) it may be quite revealing.

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Appendix 1: Questionnaire

The questionnaire relates to the research question: What *social* and *political* factors have influenced the *reactions* of Alberta We//net's stakeholders to the system's implementation?

Ask the interviewee to discuss a bit about their background, their relationship to We//net and level of involvement, and the group or groups that they think they represent. Mention that the four main groups that I am looking at are health care practitioners, government, RHAs, and We//net staff.

1. What has been the level of involvement of the various stakeholder groups in We//net planning and implementation? How has their level of involvement influenced their reaction to the program? [general discussion of stakeholder reactions—if reticence or confusion, prompt with discussion of various groups—nurses, doctors, pharmacists, government, RHAs]
2. How would you characterize the reactions of the various stakeholder groups to We//net? What have been the major barriers and facilitators?
3. How would you characterize the relationship between We//net and Alberta Health, and if this relationship has changed over the course of the project, could you describe the nature of that change? [getting at leadership]
4. What incentives exist for the various groups to support We//net programs?
5. What potential is there for We//net to affect health professionals' scope of practice? If any, how has this influenced their reactions to We//net?
6. What potential exists for We//net to affect the process of clinical policy-making and clinical autonomy in the province? If so, how has this influenced the reaction to We//net? [if unclear, prompt with items like clinical pathways, CPGs, etc. as examples of tools that might be developed and implemented through We//net]
7. What role will We//net play in informing system-level policy-making at the regional, provincial, or even national level? If so, how has this influenced the reaction to We//net?
8. Will We//net affect the relationships that health care professionals have with patients in Alberta? If so, how has this influenced the reaction to We//net?
9. Will, or has, We//net affected the balance in Alberta between hospital and community-based health care services? If so, how has this influenced the reaction to the program?
10. Has We//net affected, or is there a perception that it could affect, the economics of Alberta's health care system? If so, how has this influenced the reaction to We//net?
11. Has We//net affected, or is there a perception that it could affect, the inter- and intra-professional relationships of Alberta's health care professions? If so, how has this influenced their reaction to the program?

The second questionnaire, for We//net managers, relates to the second research question: What policies have been adopted by Alberta We//net to address the challenges presented

by these social and political factors? It is essentially the same questionnaire as that outlined above but for each question there is an additional question if the answer to the first is affirmative: How has this influenced We//net's policies and programs?

Other: Key learnings for interviewee? Other people that I might talk to? Am I missing anything here?

Appendix 2: Cover Letter

Title of Project: Stakeholder Perceptions of the Introduction of an Integrated System-Level Health Information Infrastructure: The Case of Alberta We//net

Principal Investigator:

Richard Thornley, Department of Public Health Sciences
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Co-Investigator:

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NAME OF PARTICIPANT

ADDRESS OF PARTICIPANT

DATE

Dear PARTICIPANT,

I am inviting you to be interviewed as part of a study of the implementation of the We//net program in Alberta. This study is for my thesis towards the degree of Master in Public Health (Health Services Research). My thesis supervisor is Dr. John Church, from the Department of Public Health Sciences at the University of Alberta. Dr. Church may be contacted at (780) 492-8604, while I may be reached at (780) 439-9166, or via email at thornley@telusplanet.net.

The purpose of this study is to examine the responses of stakeholders to the implementation of the We//net program in Alberta. The study will look at the political and social factors that have influenced stakeholder responses. The results of the study will benefit health professional associations, health policy makers, and the implementers of similar health information systems in Canada. To collect data for this study I am interviewing health care leaders who are stakeholders in We//net, of which you are one. In addition, I will be reviewing other information sources such as policy documents,

newspaper articles, and other research studies to form a complete picture of reactions to We//net.

If you agree to participate in the study you will be asked to participate in an in-person interview lasting approximately one hour. I will be interviewing at least ten other individuals for the study. In addition, I would like permission to record the interview so that no important points are missed. This will only occur if you feel comfortable with being recorded. You have the right to refuse to answer any question at any time. Attached to this letter is a standard consent form that I would ask you to fill out and sign before the interview.

To ensure that your privacy is protected I will take the following precautions:

- Your identity will not be reported in any presentation or publication of my findings. Although I cannot guarantee that your identity will not be inferred from the final study, I will provide you with the opportunity to review the final report so that you can determine if you feel comfortable with the way your quotes are presented.

- The transcript of your responses to my questions will be shared only with my research supervisor, Dr. Church.

- I will be responsible for safeguarding the transcripts of our interview, which will be saved to CDROM, encrypted, and password-protected. All written and electronic records of the interview will be stored in a locked filing cabinet in the office of Dr. Church for five years after the study has been completed. This is in accordance with University of Alberta research policies.

- The information will be used only for the specified purpose. If any further analysis is conducted with the study, further ethics approval will be sought first.

- There are no known risks.

- The project has received ethics approval from the University of Alberta.

You are of course free to withdraw from this study at any point. If you wish to withdraw from the study please contact Dr. Church or myself at any of the numbers given above. Following your withdrawal from the study I will destroy the recording of our interview and any transcripts of the interview that may exist. If you have any concerns about any aspect of this study, please contact Dr. Steve Hrudey, Vice-Chair, Department of Public Health Sciences, at (780) 492-6807, or steve.hrudey@ualberta.ca. Dr. Hrudey is not affiliated with this study. I look forward to meeting you at the interview.

Sincerely,
Richard Thornley

Appendix 3: Consent Form

To be completed by the research subject:

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Letter?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you agree to have your interview tape recorded?	Yes	No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason.	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?	Yes	No

This study was explained to me by:

_____

I agree to take part in this study.

_____ _____

Signature of Research Participant Date

_____

Printed Name

_____ _____

Witness Date

_____

Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____

Signature of Investigator or Designee Date

Appendix 4: Summary of We//net's Initiatives

Common Opportunities. Common Opportunities projects are defined by Alberta We//net as "the joint procurement and implementation of systems by two or more health authorities" (Alberta We//net, 2000c, p. 26). The projected benefits of this initiative include reduced procurement costs for health authorities, leveraging knowledge across regional boundaries (which is potentially very beneficial for Regions with smaller IT staffs), and encouragement of best practices. As of summer 2000, common software had been installed in thirteen health authorities with the attendant savings in terms of purchase, installation, training and support, and all 17 RHAs were participating in at least one Common Opportunity project (Alberta We//net, 2000b; 2000c).

Physician Office Systems. The goal of the Physician Office Systems initiative is to "work with doctors to evaluate physician office systems, and with software vendors to ensure that appropriate standards are adopted to enable a seamless connection to Alberta We//net" (Alberta We//net, 2000c, p. 28). By the summer of 2000 the program had deployed a pilot project at an Edmonton community health centre and initiated processes to certify office systems for We//net compatibility. The program also started planning for an Application Service Provider pilot project.

Newborn Metabolic Screening. The Newborn Metabolic Screening Program was launched in 1999 and is intended to track every newborn in the province to ensure that they are screened for several congenital metabolic conditions. Alberta Health and Wellness has projected savings of at least $600,000 per year in medical costs as a result of this program (Alberta Health and Wellness, 2000). The critical element of the program

is the assignment of a unique Personal Health Number to each newborn at birth and as of May 2000 the registration component of this application had been installed in all 17 RHAs (Alberta We//net, 2000b).

Breast Cancer Screening. In a fashion similar to the Newborn Metabolic Screening program, the Breast Cancer Screening application will ensure that women aged 50-69 are identified and receive mammograms every two years (Alberta We//net, 2000c). A program pilot was planned for 2000-2001.

Seniors Drug Profile. The Seniors Drug Profile allows providers access to prescription records for seniors under Alberta Blue Cross coverage for seniors (group 66). As of March 31, 2000 the Seniors Drug Profile had been installed in 45 sites across seven RHAs and had 631 health services providers authorized as users (Alberta We//net, 2000b; 2000c).

Pharmaceutical Information Network. On August 19, 1999 Bob Clark, Alberta's Information and Privacy Commissioner, accepted a Privacy Impact Assessment for the limited production rollout of PIN's Drug Profile System (Office of the Information and Privacy Commissioner, 1999). PIN extends the functionality of the Seniors Drug Profile to allow authorized providers confidential access to patient medication histories and decision support tools, and enable electronic prescriptions (Alberta We//net, 2000c).

Lab Test Results. This We//net application will, in a fashion similar to PIN, allow authorized health care providers access to lab test results across the Internet. As of March 31, 2000 a pilot project had been initiated in Edmonton involving Capital Health and Dynacare Kasper Medical Laboratories (Alberta We//net, 2000c).

Integrated Cancer Care Network. Working with the Alberta Cancer Board, the Integrated Cancer Care Network sought to deploy cancer care protocols integrated with electronic medical records (Alberta We//net, 2000c). This project is perhaps the most explicitly "evidence-based medicine" of any of the program's various initiatives. By the summer of 2000 the project reported deployment of the OpTx application at the Tom Baker Cancer Centre in Calgary and at a regional clinic in Lethbridge.

Spatial Public Health Information Exchange (SPHINX). SPHINX developed as a collaboration between Alberta Health and Wellness and Health Canada. The goal of the project was to "make health-related data easily accessible to public health officials to monitor and report on public health, analyze the factors influencing health, and protect citizens from disease outbreaks, environmental contamination and other potentially negative impacts on health" (Alberta We//net, 2000c, p. 10). This application, as of summer 2000, had been demonstrated at 17 sites in Alberta and another eight sites in other western Canadian provinces (Alberta We//net, 2000b).

Telehealth. The program's telehealth objectives include distance learning, psychiatry, radiology, consulting, ultrasound, cardiology, home care, and echocardiography (Alberta We//net, 2000c). By summer 2000 Alberta had 55 live videoconferencing sites (Alberta We//net, 2000b). In addition, the program had implemented an MCU bridge service which allows the simultaneous linkage of multiple video-conferencing sites.

Network Infrastructure. Rather than building a new network infrastructure, Alberta We//net represents a new investment in current infrastructure. The program has developed points of presence and network gateways to provide access to the Alberta

government's AGNpac network and manage health services information traffic (Alberta We//net, 2000c). All of Alberta's health authorities had been linked to the provincial government's wide-area network (called AGNpac) by summer 2000 (Alberta We//net, 2000b).

Table 3. Program and context timeline

Date	Action
1991	The report of the National Task Force on Health Information, released in 1991, led to the formation of the Canadian Institute for Health Information (CIHI) in 1993 (Alvarez & Zelamar, 1998).
1995	Healthcare Infostructures: The Development of Information-Based Infrastructures for the Healthcare Industry was published by the Diebold Institute for Public Policy Studies (1995).
1996	The Government of Canada released the policy document, Building the Information Highway: Moving Canada into the 21st Century, reflecting recommendations of the Information Highway Advisory Council. The report recognized that "Canada's Information Highway can and must be used to strengthen our health system" (p. 2).
September 1996	"We//net was launched in response to the Auditor General's report of September 1996 and the Minister of Health's announcement in November '96" (http://www.albertawellnet.org/milestones1.html; Marz, 1998; Noseworthy, McAllister & Bader, 2001). "It is recommended that the Department of Health in collaboration with health authorities establish a process that will guide the development of information systems capable of providing the information necessary to assess the effectiveness of publicly funded health services" (Valentine, 1996, p. 123).
October 1996	Alberta's Chief Information Officers' Council was established (Government of Alberta, 1996).

Date	Action
December 19, 1996	Ernst and Young's assessment of information management and information technology in Alberta was published: Information Management and Information Technology Issues and Opportunities Assessment: Final Report. The report stressed the need for a comprehensive, incremental, and fully inclusive approach to health information processes in Alberta.
January 1997	The Alberta We//net initiative was launched (Marz, 1998).
February 1997	We//net's Senior Reference Committee was established (with representatives from the health professions, RHAs, and Faculties of Medicine) and supported by the Technical Coordinating Group (http://www.albertawellnet.org/milestones2.html; Marz, 1998).
Early 1997	The Senior Reference Committee first met (statement from interviewee).
June 1997	IBM was "selected as the strategic alliance partner to develop a blueprint for a new health information system and to develop a tactical plan comprised of specific projects. The accounting firm of Ernst & Young was selected as the quality assurance partner to assess and validate all processes and deliverables relating to the Alberta We//net initiative" (Marz, 1998).
June 1997	The draft Health Information Protection Act was introduced in the Alberta Legislature (Alberta Health, 1997a).
August 1997	The Advisory Council on Health Infostructure was established to provide recommendations and strategic advice to the federal Minister of Health on the development of a national strategy for an integrated Canadian health infostructure (http://www.hc-sc.gc.ca/english/archives/releases/98_51e.htm).
September 27, 1997	CANARIE Inc. released Towards a Canadian Health Iway: Vision, Opportunities and Future Steps to "accelerate discussions among potential stakeholders and other public and private sector organizations in Canada leading to the development of a Canadian Health Iway" (p. ii).
November 1997	The Alberta Research Council partners with We//net to develop standards for telehealth (http://www.albertawellnet.org/milestones2.html).
June - December 1997	The Alberta We//net Strategic Blueprint Report was released and the Alberta health care system's Y2K readiness assessed (personal communication, July 25, 2000).
1998	The Canadian Institute for Health Information's Health Information Needs in Canada report was released.

Date	Action
1998	The Information Highway Advisory Council "recommended the development of a national health information infrastructure; the creation of an investment fund to support trials and demonstrations of networking technology; and the establishment of national standards for data access, data protection, and operative procedures" (Alvarez & Zelamar, 1998).
1998	The Alberta Medical Association's Annual Report (1998) commented that "IM/IT is inevitable and the medical profession must play a key role in determining the principles and guidelines for how a provincial system will be structured, managed and used. The AMA is involved on a variety of [We//net] committees to ensure certain principles are honored, [for example], privacy of a patient's personal health information record, no subsidization of the system by physicians" (p. 6).
January 1998	All Regions were visited by We//net leadership to ensure endorsement of the strategic blueprint (personal communication, July 25, 2000). RHAs began to take advantage of We//net's Common Opportunities initiative (http://www.albertawellnet.org/milestones3.html).
February 1998	The National Conference on Health Info-Structure was held in Edmonton, Alberta. Co-hosted by Health Canada and Alberta Health, "the purpose of the conference was to advance the development of a national strategy on using information and communication technologies to modernize the health system" (http://www.hc-sc.gc.ca/english/archives/releases/98_51e.htm).
February - July 1998	The program worked on funding, developing the detailed 98/99 work plan, and continued work on early start projects: Tri-region, PIN, Microsoft negotiations, stakeholder integration, Y2K provincial secretariat (personal communication, July 25, 2000).
July - August 1998	We//net finalized its 1998/1999 operating plan and three year business plan (personal communication, July 25, 2000).
September 3, 1998	The final report of the National Conference on Health Info-Structure was released (http://www.hc-sc.gc.ca/ohih-bsi/available/documents/1998_nchis_e.pdf).
1999	The Canadian Institute for Health Information, in partnership with Health Canada and Statistics Canada, released Health Information Roadmap: Responding to Needs (http://www.cihi.ca/Roadmap/rdmap.shtml), the outcome of a broad-based national consultation on health information needs that included over 500 individuals.

Date	Action
1999	The Newborn Metabolic Screening program was pilot tested in three RHAs (http://www.albertawellnet.org/milestones4.html).
February 1999	The Advisory Council on Health Info-structure released its final report to the federal Minister of Health, Canada Health Infoway: Paths to Better Health
May 1999	College of Physicians and Surgeons and the Alberta Medical Association release results of their physician health information needs assessment which examined the health informatics practices and needs of Alberta physicians (Noseworthy, et al., n.d.). "This [i.e., the assessment], together with physician representation on project task forces, and a physician advisory body which will receive input and assistance from physicians in We//net planning, will become further complements to a broader physician engagement strategy."
Summer 1999	The Seniors Drug Profile was launched at the University of Alberta and Misericordia hospital emergency departments (http://www.albertawellnet.org/milestones4.html).
September 1999	The Alberta Cancer Board launched the Integrated Cancer Care Network pilot at the Tom Baker Cancer Centre in Calgary in September 1999, for one tumor group (http://www.albertawellnet.org/milestones4.html).
October 1999	Inaugural meeting of the Western Health Information Collaborative, "a process initiated by the Western Premiers and Deputy Ministers of Health to explore collaborative opportunities with respect to health infostructure initiatives" (http://www.whic.org/public/about/).
November 1999	We//net conducted a stakeholder consultation workshop.
April 2000	The College of Physicians and Surgeons, Province of Alberta, included a copy of Alberta We//net's *Guide to alberta we//net* in an issue of The Messenger, its newsletter.
April 2000	We//net finalized a six year Operating Plan.
May 8, 2000	Alberta We//net Operating Plan presented to the Council of CEOs.

Appendix 5: Alberta's Legislature

Alberta's parliamentary system is "based on the British principle of responsible government, meaning that the cabinet must have the support of a majority in the elected Assembly to continue governing" (http://www.assembly.ab.ca/pub/gdbook/Part1/page1.htm). The political party with more than half of the seats in the elected Assembly forms a majority government and the leader of that party is chosen as the Premier of the province. The Conservative Party of Alberta has formed majority governments since 1971. Other parties with members elected to the Legislative Assembly are known as "opposition" parties. The party with majority support appoints, from among its number, Ministers to form a cabinet responsible for proposing laws and administering government departments (e.g., the Minister of Health is an elected MLA appointed to a cabinet position by the Premier). Given a healthy majority and traditional voting along party lines, policies of the governing majority tend to be adopted. "The role of an opposition party is to criticize government activity, propose improvements, and present itself to the public as an alternative to the party in office" (http://www.assembly.ab.ca/pub/gdbook/Part2/page5.htm).

Further information about Alberta's Legislature may be found at http://www.assembly.ab.ca/pub/gdbook/index.htm.

Appendix 6: Document Review

Table 4 below identifies the published and unpublished source documents that were reviewed as part of this case study. Materials used in the literature review are listed in *References*. Documents are listed in reverse chronological order. Where a date was not indicated on the source document, this is indicated in the table as "n.d." Several documents which were made available to this study in confidence are not listed in table 4.

Table 4. Document review

Date (Year/ Month/Day)	Document
2001/03	Alberta We//net. (2001). *Alberta we//net, update 2001*. Retrieved May 27, 2001, from http://www.albertawellnet.org/slideshows/update032001/sld001.htm
2001	Noseworthy, T., McAllister, J. A., & Bader, D. (2001). A provincial strategy in the development of Canada's health infostructure. *ElectronicHealthCare.com*, *1*(1), 23-31. Retrieved August 7, 2001, from http://www.longwoods.com/eh/eh11/eh11nt.html
2000/08/31	Designed by Alberta Wellnet, all about Blue Cross. (2000, August 31). *Smoky River Express*. Retrieved August 31, 2000, from http://www.smokyriverexpress.com/newsroom/volume34/000621/story6.html
2000/Summer	Alberta We//net. (2000). *Alberta we//net news*. 2(2).
2000/06/02	Johnsrude, L. (2000, June 2). Alberta should follow federal lead, scrap health database, MacBeth says. *The Edmonton Journal*, p. A7.
2000/May-June	Opening the file on IM/IT. (2000). *The Alberta Doctors' Digest*, *25*(3), 12-14.
2000/05/08	Alberta We//net. (2000). *Alberta we//net operating plan: Council of CEOs, May 8, 2000*. Edmonton, AB: Alberta We//net.

Date (Year/ Month/Day)	Document
2000/05/08	Alberta We//net. (2000). *Alberta we//net update: Progress to March 31, 2000, for the Council of Chief Executive Officers*. Edmonton, AB: Alberta We//net.
2000/04/28	McFadden, E. (2000, April 28). *David Thompson Health Region to launch new drug profile application*. Retrieved June 28, 2000, from http://www.dthr.ab.ca/press/20000428.htm
2000/04	A guide to alberta we//net. (2000, April). *The Messenger (College of Physicians and Surgeons of Alberta)*, 77, 14.
2000/04	Alberta We//net. (2000, April). *Update: alberta we//net operating plan*. Edmonton, AB: Alberta We//net.
2000/03	Olsen, S. (2000, March). A Ministry of Health and Wellness, Orwellnet and truth squads. What's next? *Times. 10 Magazine*. Retrieved June 23, 2000, from http://www.times10.org/olsen_march_2000.htm
2000/February-March	Alberta We//net. (2000). *Alberta we//net news*. 2(1).
2000/01/31	Alberta Medical Association. (2000). *Information management in medical practice: MAGWI report*. Edmonton, AB: Alberta Medical Association. Retrieved February 16, 2001, from http://www.amda.ab.ca/general/imit/info-mgmt-index.html
2000	Alberta Health and Wellness. (2000). *Health is everyone's business: A snapshot of some of Alberta's wellness initiatives*. Edmonton, AB: Alberta Health and Wellness.
2000	Valentine, P. (2000). *Annual report of the Auditor General of Alberta, 1999-2000*. Retrieved August 30, 2001, from http://www.oag.ab.ca/pdf/ar1999-00.pdf
1999/12/12	Ko, M. (1999, December 12). Your health files open to snooping. *The Edmonton Journal*, p. A13.
1999/12/10	Government rushing through Health Information Act with closure. (1999). *UNA Stat*, *6*(16), 1.

Date (Year/ Month/Day)	Document
1999/12/09	Health records law faces charter of rights challenge. (December 9, 1999). *Edmonton Journal*, p. B8.
1999/12/09	Johnsrude, L. (1999, December 9). Health-care debate dominates session. *The Edmonton Journal*, p. A7.
1999/12/09	Western Health Information Collaborative. (1999, December 12). *Western Health Information Collaborative: Introduction to WHIC.*
1999/12/06	Caulfield, T., & von Tigerstrom, B. (1999, December 6). Good and bad in health-privacy bill. *The Edmonton Journal*, p. A11.
1999/12/04	Johnsrude, L. (1999, December 4). Battle to delay health data law. *The Edmonton Journal*, p. A7.
1999/12/03	Dickson, G. (1999). *Bill 40 Health Information Act*. Edmonton, AB: Alberta Liberal Caucus.
1999/12/03	Johnsrude, L. (1999, December 3). Doctors protest threat of closure: Privacy bill criticized for lack of control over use of personal health data. *The Edmonton Journal*, p. A13.
1999/12/01	Scary move on your health info. (1999, December 1). *The Edmonton Journal*, p. A17.
1999/12	Driver, D. (1999, December). AB seniors' drug files go online. *Pharmacy Connects*. Retrieved August 31, 2000, from http://www.pharmacyconnects.com/content/phpost/1999/12-99/ppo129913.html
1999/November-December	Rossall, Jon P. (1999). Privacy of health information will be a hot topic in year 2000. *The Alberta Doctors' Digest*, *24*(6), 20-23.
1999/11/27	Don't rush health information law. (1999, November 27). *The Edmonton Journal*, p. A14.

Date (Year/ Month/Day)	Document
1999/11/26	Lisac, M. (1999, November 25). Bill 30 a health Trojan horse: Information privacy would be exposed to an electronic network. *The Edmonton Journal*, p. A16.
1999/11/25	Privacy watchdog fears misuse of personal health information: Albertans need greater protection, Clark suggests. (1999, November 25). *The Edmonton Journal*, p. A7.
1999/11/06	Johnsrude, L. (1999, November 6). Personal records not protected in health bill—MLA. *The Edmonton Journal*, p. A6.
1999/11/05	Johnsrude, L. (1999, November 5). Bill proposes sharing some health data. *The Edmonton Journal*, p. A7.
1999/08/19	Office of the Information and Privacy Commissioner. (1999). *News release: Commissioner comments on Alberta Health and Wellness privacy impact assessment for a drug profile system*. Edmonton, AB: OIPC. Retrieved January 23, 2001, from http://ipc.developersedge.com/PressRel/99-PIA-001.htm
1999/07/22	Noseworthy, T. (1999). *alberta we//net: How will it influence clinicians?* Presentation made at the Calgary Health Region Workshop on Health Informatics, Calgary, Alberta, July 22, 1999. Retrieved January 6, 2001, from http://xweb.crha-health.ab.ca/clin/cme/hi_11.ppt
1999/06/02	Girard, R. (1999). *Alberta we//net: Infrastructure Steering Committee, province wide network design*. Presentation to the Partnership for Health Informatics/Telematics Working Group 4: Interoperability Standards, Thursday May 13, 1999 & Friday May 14, 1999.
1999/May-June	McAllister, J. (1999). Alberta we//net, integrated personal health information: A presentation to the RF. *The Alberta Doctor's Digest*, *24*(3). Retrieved May 30, 2000, from http://www.amda.ab.ca/general/communications/publications/add/1999/may-june99/wellnet.html

Date (Year/ Month/Day)	Document
1999/05/27	Government of Alberta. (1999, May 27). *New deputy team to look for better ways of working together*. Retrieved August 31, 2000, from http://www.friaa.ab.ca/nws-rls/may27-99.html
1999/05	Ohlhauser, L., Burns, R. A., Kolotyluk, T., & Noseworthy, T. (1999, May). *Physician health information needs assessment*. Edmonton, AB: College of Physicians and Surgeons (Province of Alberta) and Alberta Medical Association.
1999/01/01	McFadden, E. (1999, January 1). *DTHR business plan & budget highlights, 1999/2000*. Retrieved June 23, 2000, from http://www.dthr.ab.ca/press/19990101.htm
1999	Valentine, P. (1999). *Annual report of the Auditor General of Alberta, 1998-1999*. Retrieved August 30, 2001, from http://www.oag.ab.ca/pdf/ar1998-99.pdf
1998/November-December	Alberta we//net: Physicians integrating care across Alberta. (1998). *The Alberta Doctors' Digest*, *23*(6), 6-7.
1998/November-December	The wired physician. (1998). *The Alberta Doctors' Digest*, *23*(6), 8-9.
1998/11/03	Walker, R. (1998). Will Wellnet system be a $1b white elephant? Regional health authorities may not be capable of hooking into the system. *Medical Post*, *34*(37), 63.
1998/October-November	Dickson, G. (1998). Medical record privacy. *Law Now*, *23*, 38-39.
1998/October-November	Driver, D. (1998). Huge computer network links three Alberta hospital sites. *Canadian Healthcare Manager*, *5*(6), 16.
1998/09	Canadian Institute for Health Information. (1998). *Navigating the swirl: An overview of Canadian health informatics initiatives*. Toronto, ON: CIHI.
1998/June-July	Milne, C., McLeod, C., Square, D., & Driver, D. (1998). Technology in the provinces. *Canadian Healthcare Manager*, *5*(4), 41-45.

Date (Year/ Month/Day)	Document
1998/05	Alberta We//net. (1998). *Alberta we//net news*. Issue 3.
1998	Alvarez, R. C., & Zelamar, J. (1998). Moving towards the next millennium: Health informatics in Canada. *Hospital Quarterly, 1*. Retrieved August 31, 2000, from http://www.longwoods.com/hq/spring98/perspective.html
1998	Alberta We//net. (1998). *Providing a road map for alberta we//net's future: Highlights of the strategic blueprint*. Edmonton, AB: Alberta We//net.
1998	Valentine, P. (1998). *Annual report of the Auditor General of Alberta, 1997-1998*. Retrieved August 30, 2001, from http://www.oag.ab.ca/pdf/ar1997-98.pdf
1997/12	Alberta Health. (1997). *Consultations of the draft Health Information Protection Act: A summary of views*. Edmonton, AB: Alberta Health. Retrieved August 31, 2000, from http://www.health.gov.ab.ca/public/document/hipasum.htm
1997/09/09	Powell, J. (1997, October 9). Technology lifeline. *Financial Post Daily*, p. 35.
1997/03	Alberta Health. (1997). *Striking the right balance: A summary of views*. Edmonton, AB: Alberta Health.
1997	Valentine, P. (1997). *Annual report of the Auditor General of Alberta, 1996-1997*. Retrieved June 10, 2000, from http://www.oag.ab.ca/pdf/ar1996-97.pdf
1996/12/19	Ernst & Young. (1996). *Information management and information technology issues and opportunities assessment*. Edmonton, AB: Alberta Health and Wellness.
1996/12/05	Alberta Health. (1996). *Striking the right balance: A discussion paper*. Edmonton, AB: Alberta Health.
1996/10/02	Government of Alberta. (1996, October 2). *New council focuses on information resources*. Edmonton, AB: Government of Alberta. Retrieved July 25, 2000, from http://www.gov.ab.ca/pab/can/199610/4253.html

Date (Year/ Month/Day)	Document
1996	Valentine, P. (1996). *Annual report of the Auditor General of Alberta, 1995-1996*. Retrieved June 10, 2000, from http://www.oag.ab.ca/pdf/ar1995-96.pdf
n.d.	Alberta We//net. (n.d.). *A guide to alberta we//net*. Edmonton, AB: Alberta We//net.
n.d.	Alberta We//net. (n.d.). Alberta We//net Web site: http://www.albertawellnet.org
n.d.	MAGWI. (n.d.). *Draft proposal for Medical Advisory Group—we//net Initiative (MAGWI) Infrastructure*.
n.d.	MAGWI. (n.d.). *Medical Advisory Group—Information Management/Information Technology (MAG—IM/IT)*.
n.d.	Noseworthy, T., Wilson, D., Swiniarski, J., Hall, E., Bell, N., Jennett, P., & Hayward, R. (n.d.). *Health informatics assessment of Alberta physicians*. Retrieved July 5, 2000, from http://www.cche.net/chipp/background/needs_cmaj_1.htm
n.d.	*Your Alberta Liberal MLAs . . .fighting for public health care and your personal health information privacy*. (n.d.). Retrieved June 23, 2000, from http://www.altaliberals.ab.ca/publichealthcare/healthprivacyinvaded.htm

Appendix 7: Thematic Summary

Table 5 below compares the themes that emerged from the literature review with those that emerged from this study (i.e., interviews and document review). Themes are identified as incentives or challenges to health infostructure (although some factors are identified as being both incentives and challenges).

Table 5. Thematic summary

Themes	Literature Review	Interviews and Document Review
Care management (electronic patient record, point of care data collection, network-wide access)—incentive	✔	✔ (shared information access, Seniors Drug Profile, Pharmaceutical Information Network, Lab Test Results, Integrated Cancer Care Network)
Cost efficiency and organizational effectiveness—incentive	✔	✔ (cost avoidance through Common Opportunities)
Cost management—incentive	✔	
Data issues—challenge	✔	
Decision support and clinical reminder tools—incentive	✔	✔ (support for evidence-based practice, improved decision making)
Disintermediation—incentive	✔	
Economic issues (cost to individual providers, cost to organizations and systems)—challenge	✔	✔ (cost to stakeholders, voluntary funding model, human resource burden, Physician Office Systems initiative)
Geopolitical issues—challenge		✔
Governance—challenge/incentive		✔
Influence on stakeholder business competitiveness—challenge		✔

Themes	Literature Review	Interviews and Document Review
Inter-professional relationships—challenge/incentive	✔	✔ (information sharing, scope of practice, threat to profession)
Leadership (including individual leadership, institutional leadership)—challenge/incentive	✔	✔ (importance of individual leadership, consensus building)
Pre-existing organizational problems—challenge		✔ (Regionalization, local organizational problems)
Privacy, confidentiality and security—challenge	✔	✔ (privacy and confidentiality, secondary uses of information)
Private sector involvement—challenge		✔
Professional evolution—challenge/incentive		✔
Provider accountability and autonomy—challenge/incentive	✔	✔ (potential challenge)
Receptivity (influenced by perceived value, past experience of stakeholders, ability to act or recognize potential of infostructure)—challenge	✔	✔ (RHA size, past experience)
Stakeholder participation model—challenge/incentive		✔ (voluntary model)
Standards—challenge/incentive	✔	✔ (We//net's network infrastructure)
Support for health promotion and population health—incentive	✔	✔ (Newborn Metabolic Screening Program, Breast Cancer Screening, Spatial Public Health Information Exchange)
Telemedicine and teleconferencing—incentive	✔	✔ (We//net Telehealth project)
Timing of benefits and deliverables—challenge	✔	✔
Value-added informatics applications—incentive	✔	